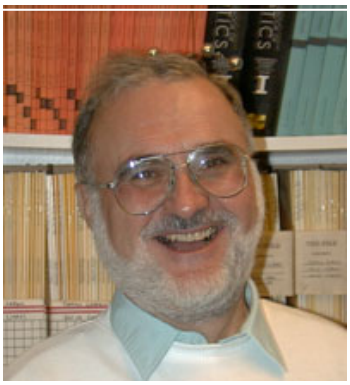
Colorado State University

Physics Department Newsletter

Issue 20 May 2009

From the Chair



Dear Physics Alumnus/Alumna and Friends of the Department:

Two very eventful months have passed dealing with budget cuts. We can now only hope that our estimates were accurate and we will not be hit harder. Fortunately I had a chance

during Spring Break to join Brian Jones and his team of the Little Shop of Physics to visit the Navajo and Ute reservations in Southern Colorado and New Mexico to get away from all the problems and collect new energy to tackle the looming problems. Brian was right when he said: “Once in a while one has to get away and be reminded why we chose to be educators.” It was an amazing experience to see in particular the enthusiasm, curiosity, and motivation of the young kids. You will find a report in this Newsletter.

Another great experience was the visit of the delegation from the Wiesbaden University of Applied Sciences (5 professors and officials from the International Office and 12 students) and the Lord Mayor of the City of Russelsheim, where the campus is located. Ruesselsheim is also the city where the Opel Factory, which belongs to the General Motors Corporation, is located. We have an Agreement of Cooperation with this University and students from there have done or doing their Practical Training semester right now here at CSU in departments of the Colleges of Natural Sciences (CNS) and Engineering. We have visited the Wiesbaden University of Applied Sciences with a delegation consisting of Prof. Jan Nerger, Interim Dean of the CNS, , Prof. Hochheimer, Chair, Department of Physics, Arlene Nededog, Director of the Undergraduate Retention Programs, College of Natural Sciences, , Doug Hutchinson, Mayor of Fort Collins, and 8 students from the CNS.

Finally let me cite an e-mail our Key Adviser, Prof. Mark Bradley, received form a parent.

Thank you for your time with our son. I am not sure what he will decide, but we were very impressed with the department.

I am a physician (as is my husband), but I am currently an Assist. Professor in the biology/public health department at University of Nebraska-Kearney. The effort Colorado State shows to potential students is far superior to that of UN-Kearney.

Again, thanks for your time.

From the Chair

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

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.

Inside This Issue

Canyon of the Ancients

Physics News

Publications:

Prof. Bruce Berger is the first author of the KamLAND Collaboration publication entitled "*The KamLAND Full-Volume Calibration System*" , arXiv:0903.0441v1 [nucl-ex]

Abstract: We have successfully built and operated a source deployment system for the KamLAND detector. This system was used to position radioactive sources throughout the delicate 1-kton liquid scintillator volume, while meeting stringent material cleanliness, material compatibility, and safety requirements. The calibration data obtained with this device were used to fully characterize detector position and energy reconstruction biases. As a result, the uncertainty in the size of the detector fiducial volume was reduced by a factor of two. Prior to calibration with this system, the fiducial volume was the largest source of systematic uncertainty in measuring the number of anti-neutrinos detected by KamLAND. This paper describes the design, operation and performance of this unique calibration system.

Comments: 30 pages, 22 figures, to be submitted to JINST

P. W. Younk, *"Estimating the Flux of the Brightest Cosmic-Ray Source Above 57 × 1^{18} eV",* The Astrophysical Journal Letters **696**, L40 (2009).

D. J. Keavney, X. M. Cheng, **and K. S. Buchanan**, *"Polarity reversal of a magnetic vortex core by a unipolar, nonresonant in-plane pulsed magnetic field",* Applied Physics Letters **94**, 1 (2009).

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

Aaron M. Hagerstrom, Wei Tong, Mingzhong Wu, Boris A. Kalinikos, and **Richard Eykholt,** "*Excitation of chaotic spin waves in magnetic film feedback rings through three-wave nonlinear interactions",* Physical Review Letters, accepted (2009).

J. Das, Y. Y. Song, N. Mo, P. Krivosik, C. E. Patton *"Electric-field-tunable low loss multiferroic ferrimagnetic-ferroelectric heterostructures",* Adv. Mater. DOI: 10.1002/adma.200803376 (2009). [Also announced in News in Advanced Materials]

S. S. Kalarickal, N. Mo, P. Krivosik, and **C. E. Patton,** "*Ferromagnetic resonance linewidth mechanisms in polycrystalline ferrites: Role of grain-to-grain and grain-boundary two-magnon scattering processes"*, Phys. Rev. **B 79**, 094427 (2009).

César L. Ordóñez-Romero, Boris A. Kalinikos, Pavol Krivosik, Wei Tong, Pavel Kabos, and Carl E. Patton, *"Three-magnon splitting and confluence processes for spin-wave excitations in yttrium iron garnet films - Wave vector selective Brillouin light scattering measurements and analysis"* (accepted, Physical Review B)

Young-Yeal Song, Jaydip Das, Pavol Krivosik, Nan Mo, and Carl E. Patton, *"Electric field tunable 60 GHz ferromagnetic resonance response in barium ferrite - barium strontium titanate multiferroic heterostructures"* (accepted, Applied Physics Letters)

Presentations:

Prof. Miguel Mostafa taught the 22nd Spring School on Particles & Fields at the Department of Physics in Tung-Hai University, Taiwan. URL: http://www.phys.sinica.edu.tw/~sspf/2009/

Prof. Bruce Berger visited the University of Nebraska on March 6 to give the High Energy Physics Seminar. The title of his talk was *"Neutrino Physics with KamLAND".*

Prof. Bruce Berger participated in the KamLAND collaboration meeting held at UC Berkeley on March 19-21. He gave a talk, with the title *"KAMFEE Report",* which was an update on the status of the KamLAND data-acquisition electronics.

Prof. Kristen Buchanan attended the American Physical Society March Meeting in Pittsburgh where she gave an oral presentation entitled *"Thickness and field dependence of the driven dynamic mode-splitting of magnetic vortices"* and chaired a session.

Prof. Mingzhong Wu, Aaron Hagerstrom, Wei Tong, Boris Kalinikos, and Richard Eykholt gave an invited talk entitled "*Microwave chaotic oscillator – a device based on the three-wave and four-wave interactions of spin waves in magnetic films"* at the IEEE Centennial Subsection Seminar, Avago Technologies, Fort Collins, April 15, 2009.

Prof. Mingzhong Wu, Corneliu Nistor, Zihui Wang, and Ke Sun gave a talk entitled "*Experimental demonstrations of microwave-assisted magnetization switching"* at the INSIC EHDR Technical Review Meeting, Minneapolis, April 7-8, 2009.

Sangita Kalarickal attended the APS March meeting in Pittsburg Pennsylvania on March 18, 2009 and gave a talk entitled *"Physical damping processes in Co-Cr granular films"* Sangita Kalarickal, Pavol Krivosik, Nan Mo, Carl E. Patton, and Stella Wu

Young Yeal Song gave an invited talk at the Advanced Materials Research Institute (AMRI) on March 19, 2009 at the University of New Orleans, New Orleans, Louisiana entitled *"Ferromagnetic Films and Ferromagnetic-Ferroelectric Heterostructures for Magneto-electric Devices"*

Carl Patton attended the INSIC meeting at Minneapolis on April 7, 2009 in Minnesota and gave a talk entitled *"Damping in Co-Cr films and Ho-doped Fe thin films"* Sangita Kalarickal, Pavol Krivosik, Carl E. Patton, Stella Wu, and Thomas Ambrose

Jaydip Das attended the MRS meeting on at San Francisco, California on April 15, 2009 and gave an invited talk entitled *"Giant Magneto-electric Coupling in Monolithic Multiferroic Heterostructures"* Jaydip Das, Young-Yeal Song, Nan Mo, Pavol Krivosik, and Carl E. Patton

The following students have passed their examination successfully:

Ph. D.

Richard Cox successfully defended his thesis *"Nonlinear Spin wave Instability Processes in Hexagonal Ferrites"* on Thursday, April 16, 2009

Physics News

(**Advisors: Prof. Carl Patton)**

Ph. D. Preliminary Exam

Mark Sweeney has passed his Ph. D. preliminary exam on January 13, 2009. He gave a presentation entitled "*Vortex Phases in Superconductors"*
(Advisor: Prof. Marty Gelfand)

M.S.:

Jared Smith gave his presentation entitled *"A Quasiclassical approach to weak localization"* on March 5, 2009 and passed his Master examination. (A**dvisors**: **Prof. Marty Gelfand**).

Eric Bronson gave his presentation entitled *"Vortex Entry in Narrow, Thin-film Superconducting Strips"* on March 31, 2009 and passed his Master examination.
(A**dvisors**: **Prof. Marty Gelfand**).

Dan Ruterbories gave his presentation entitled *"Measurements of Single Pion Production in Neutrino Scattering at K2K."* on April 14, 2009 and passed his Master examination.
(A**dvisors**: **Prof. Bruce Berger**).

Matt Vogel gave his presentation entitled *"Charged-Current Coherent Pion Production in Neutrino Scatting on Carbon-12."* on April 16 and passed his Master examination.
(A**dvisors**: **Prof. Bruce Berger**).

William Johnston gave his presentation entitled "Optical Crosstalk and Particle Detector Applications of Pixelated Photodiodes" on April 28 and passed his Master examination.
(A**dvisors**: **Prof. Robert Wilson**).

Other News:

Prof. Richard Eykholt received the 2008-2009 Jack E. Cermak Advising Award

Undergraduate **Jeremy May** has been selected for the SURF NIST Boulder program for this summer and **Aaron Hagerstom** is on the alternate list.

Professors Miguel Mostafa has been elected as the new CNS At-Large representatives to the Faculty Council. He will serve a three year term.

Prof. Bob Leisure is a member of the International Advisory Board for the 5th Forum on New Materials Symposium in Montecatini Terme, Italy, June 13-18, 2010. URL:
http://www.cimtec-congress.org/2010/index.asp

Brian Jones, Sheila Ferguson, Christa Koos, Christine Aguilar, Kevin Gosselin, Nisse Lee, Nicole Prentice, and **Nanjoo Kwan**. Participated in the Colorado Global Climate Conference for high school students on April 14, 2009 at the Colorado Convention Center. Little Shop of Physics hosted 3 breakout sessions, the closure session, and the exhibit hall. The conference was sponsored by CMMAP, the Governor's Energy Office and Rocky Mountain High School.

The performance of undergraduate **Mitchell Knaub** in this year's CURC (Colorado Undergraduate Research Conference) Poster Session has earned him HIGH HONORS.
(**Advisor: Prof. Mingzhong Wu**)

Visit of Greeley West High School

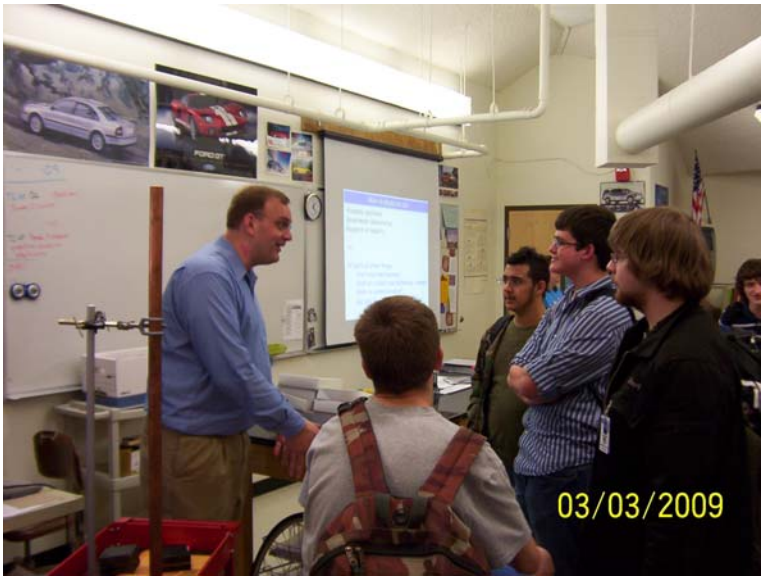
On Tuesday, March 3, 2009 Professor Roberts and Professor Hochheimer visited Greeley West High School. After and Introduction by Professor Hochheimer, Professor Roberts gave his presentation about the Physics program here at CSU. He also introduced some new demonstrations which were very well received by the students.

He gave two 1 ¼ hours presentations to the largest classes we ever had. In particular, the large number of students in the AP/IB class as well as the participation of the students in both classes was a wonderful experience. Science teacher, Mr. Gary MacDonald, has invited us to come back in January next year. He believes that our presentation and demonstrations will increase the number of students who will take a physics class.

Students getting ready for the presentation

Prof. Roberts and Science teacher, Mr. Gary MacDonald

We have not yet started the presentation



Little Shop of Physics 18th Annual Open House

Over 5000 Visitors Attend the Little Shop of Physics 18th Annual Open House

The Little Shop of Physics is one of the busiest and best-known science outreach programs in the country. Each year, the dozen or so permanent staff and undergraduate interns who run the program join with a hundred volunteers to set up everything we have for a full day of hands-on science excitement, the annual Open House.

This year, over 5000 people spent Saturday, February 28 with us, exploring, investigating, and learning. This is the largest event of its kind that we know of in the country, and, as best we can determine, it's the second largest academic event of *any* kind that takes place at Colorado State each year. (The College of Liberal Arts graduation is larger.) Folks drove from New Mexico and South Dakota for this event. People stayed overnight in Fort Collins to be here when our doors opened. Schools brought busloads of kids from 50 miles away. Teachers gave extra credit to their middle school students for writing a report on their explorations. Teachers got ideas for their classes. Parents bought Science Activity Kits for their children. And, everywhere you looked, undergraduate students in the trademark tie-dye colors were ready to help explain everything.

A special thanks is due to the undergraduate interns who spent several Saturdays getting things ready, spent a long Friday night setting up, and spent a 12 hour day on February 28 hosting our visitors and, at the end of the day, packing boxes and putting everything away.

The highlight of the Open House is our 250+ hands-on experiments in the light room and the dark room. Visitors explored the science of motion, energy, and chaos, and saw a bit of the world beyond the rainbow. They wore 3 different kinds of 3D glasses, stuck magnets to iron filings steel shot and old television sets, used infrared to see inside their bodies, became part of electric circuits.

This year we added a new element with our CMMAP-sponsored Atmospheric Adventures area. Folks young and old made clouds, painted hurricanes, created ice cores and learned a bit about the science of weather and climate.

And, every half hour, a crowd gathered for our interactive presentations. We launched stuffed hamsters, shot three foot sparks, made fountains of fog, and amazed and informed our visitors.

Erin Massey, one of our undergraduate interns, runs the "Chilly Drilly" with a young student.

Is it magic? No, it's science. Nisse Lee, a recent graduate, shows a surprisingly safe flame.

The Little Shop of Physics threw a science party, and 5000 people came. It was a great day. We'll do it again next year, on the last Saturday in February. Until then, we'll continue our round of school visits and teacher workshops.

We've presented programs to a quarter of a million kids, and we are just getting started.

Learn more about the Little Shop of Physics at http://littleshop.physics.colostate.edu.

Little Shop of Physics 18th Annual Open House (continued)

Launching an indoor hot air balloon powered by a hair dryer.

Exploring plasmas on the “dark side” of the Little Shop.

Chris, Nisse and Nanjoo (our visiting Korean scholar) make ice cream with liquid nitrogen.

Distinguished Alumnus and Scholarship Award Ceremony

On Friday, April 10, 2009 we had our annual award ceremony for our Distinguished Alumnus and our Scholarship recipients. This year the Distinguished Alumnus Award was presented to **Dr. David Giltner**. He received his Ph. D. here at Colorado State University in 1996 working with Prof. Siu Au Lee. He contributed generously to the remodeling of the Physics Department.

Left to right: Prof. Hans D. Hochheimer and Dr. David Giltner

After receiving the plaque Dr. Giltner gave a presentation entitled *"Mapping a Physics Education into a career in Product Development"*

Before his presentation Prof. Richard Eykholt presented the scholarship awards to the students. **Erin Massey, Kim Erickson, Keith Wernsing** and Liam Kilcommons received the First-Year Physics Scholarship.

The Physics Alumni Scholarship has been awarded to **Caley Buxton** and **Kristen Voigt**.

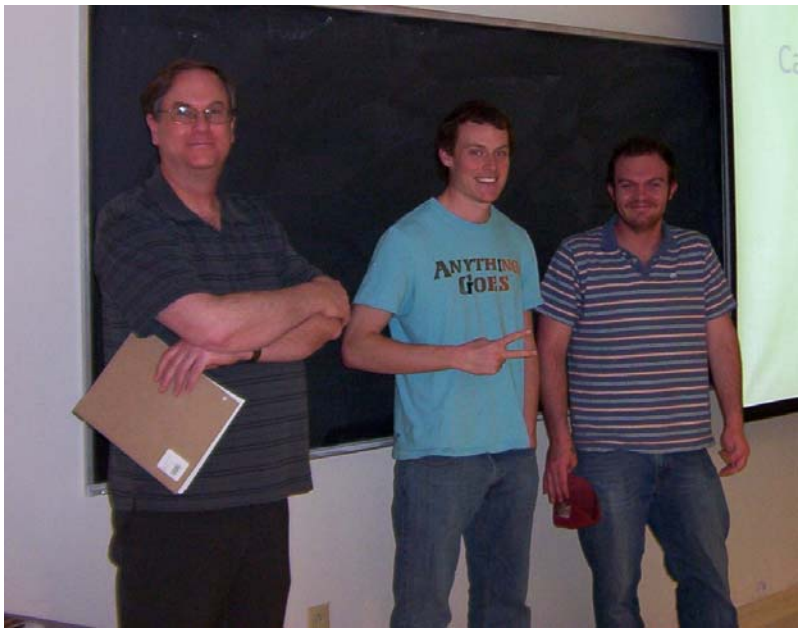
Andrew Davis received the Winder Scholarship and **Nick Lewkow** the Sites-Regelson Scholarship.

Left to right: Prof. Richard Eykholt, Keith Wernsing, Liam Kilcommons, Erin Massey

Prof. Richard Eykholt and Kristen Voigt

The Louis R. and Gladys Z. Weber Scholarship has been awarded to **Jeremy May**

Distinguished Alumnus and Scholarship Award Ceremony (continued)



Left to right: Prof. Richard Eykholt, Andrew Davis, Nick Lewkow

Prof. Richard Eykholt (left) and Jeremy May

With the Little Shop on the LSOP/NASS Four Corners Spring Break Trip

On Sunday, March 15, 2009 I joined Brian Jones and his team from the Little Shop of Physics (Erin Massey, Tyler Hutson, Chris Gillespie, Sheila Ferguson, Kenn Lonnquist, Chris Yokum, Christine Aguilar) on their trip to various schools on the Navajo and Southern Ute Indian Reservation. They were joined by Ty Smith, the Director of the Native American Student Services (NASS) at CSU, Aaron Benally, the Coordinator of Women and Minorities in Engineering, College of Engineering, and two Native American students from Mechanical Engineering, Derrick Benallie, and Daryl Benally. What looked at first glance like a vacation trip turned out to be 16 hours days. Fortunately, Brian granted me more rest than himself and his team, so that I was not as tired as the rest of the team and could observe Erin sleeping so deeply on concrete during lunch break that even a bomb could not have woken her up.

We arrived Sunday night shortly after 9:00 PM at the Jolly Rancher Bed and Breakfast near Cortez, Colorado where we stayed for 3 nights.

Left to right: Kenn Lonnquist, Tyler Hutson, Chis Gillespie, Sheila Ferguson, Brian Jones, Renate Hochheimer

With the Little Shop on the LSOP/NASS Four Corners Spring Break Trip (continued)

Next morning at 5:20 AM the LSOP drove to the Ojo Amarillo (Yellow Eye) Elementary School on the Navajo reservation in Fruitland, New Mexico. The sign at the School advertised the event in a prominent way.

After the set up of the experiments we started to see the kids from 8:00 AM on

Kids enjoy the experiments

Aaron Benally explains the Sphere Smasher experiment to the kids.

Left to right: Renate Hochheimer, Prof.. Hochheimer, Sheila Ferguson, Brian Jones

Prof. Hochheimer explains an experiment called String Thing

With the Little Shop on the LSOP/NASS Four Corners Spring Break Trip (continued)

One of the most famous experiments-Soaring Sphere

The Soaring Sphere experiment

Where is the ball?

Christine Aguilar and the Comb experiment

The most amazing experience for me was to see the enthusiasm, curiosity, and motivation of the little kids. My wife, who is a teacher herself, was also very amazed about the expression of gratitude by the students. I have asked myself why is that not preserved when they get older. What are we doing wrong? Unfortunately as a physicist I don't have the training to do research in this field, but it seems to me it would be incredibly important to conduct such research and find answers.

At 4:00 PM Brian and Sheila conducted the teacher workshop. Called "The Rainbow and Beyond". At 5:00 PM we had then a delicious Indian Taco dinner. The day's events continued at 6:30 PM with the Community Night, where parents and kids could enjoy the experiments together, and Brian gave a presentation entitled "Beyond the Rainbow". He showed properties of Infrared radiation which was very well received with "ahs" and "ohs" of the audience. The big final was of course shooting T-shirts with a leaf blower into the audience.

At 8:00 PM they started to pack up the equipment and headed back to the Jolly Rancher Bed and Breakfast place where they arrived shortly after 10:00 PM.

The next day it started all over again. This time we visited Northwest High School and Mesa Elementary School of SASI (Shiprock Associated Schools, Inc.) in Shiprock, New Mexico. The schools are really fantastic in their design and provide one of the best learning environments I have encountered .

Brian skipped this time the teachers workshop so that he and his team could get some recovery time before the events in the evening.

Since Brian learned from previous trips he included a free day before the next two school visits. On Wednesday we had a chance to learn something about the Anasazi Indian culture by visiting the Anaszi Museum near Cortez. Dr. Trish from the museum gave a really interesting and exciting tour of the museum and the ruins. She even allowed us to practice spear throwing using an atlatl spear thrower. Among all the technologies in-

With the Little Shop on the LSOP/NASS Four Corners Spring Break Trip (continued)

vented the atlatl and dart was the first true weapons system, consisting of both a projectile and a launching device. Erin looked like Artemis (Roman Diana), the Goddess of the Hunt, throwing the spear.

Erin Massey

The famous Shiprock

Renate Hochheimer

Left to right: Our host, Mrs. Anne Mc Ginley, Science teacher at Northwest High School, Renate Hochheimer, Brian Jones.

With the Little Shop on the LSOP/NASS Four Corners Spring Break Trip (continued)

The library

After the visit of the museum we drove to the Canyon of the Ancients also near Cortez, where we had a bag lunch and did some hiking. It is one of the most beautiful places I have seen and everybody who is in the region should visit it .

Entrance of the Canyon of the Ancients

With the Little Shop on the LSOP/NASS Four Corners Spring Break Trip (continued)

Rock formation in the Canyon of the Ancients

View of the Ute Mountains

Ancient dwelling. Left to right: Ty Smith, Jr, Levi, Erin Massey, Tyler Hutson

Rock formation in the Canyon of the Ancients

Me at the abyss

With the Little Shop on the LSOP/NASS Four Corners Spring Break Trip (continued)

Another hit: The voice activated car.

Erin Massey shows an experiment called Good Vibrations to a student

The next morning Brian and his team set up the LSOP in the Southern Ute Education Center in Ignacio. Though they had a full program again, the fact that they could leave everything for the next day made it a little bit easier for all. In particular, a large number of teachers signed up for the workshop, showing great interest in such training

Packing up after a long day (Kenn Lonnquist (middle) Erin Massey (right)

Left: Brian Jones and Sheila Ferguson and the LSOP team

After a Mexican dinner in Cortez we drove to Ignacio on the Ute Indian Reservation in Colorado where we stayed in the new Sky Ute Casino and Hotel. Though the food is not the best the rooms and the amenities of the hotel are a great experience.

Since I had commitments on Friday, Renate and I drove back Thursday after a short visit at the center. Though strenuous I would not want to have missed this trip. So, thank you Brain and the LSOP team for inviting me to join and experience firsthand what you are doing.

Birthday Celebration in the Department

This year we had quite a number of milestone birthdays in the department (80, 75, 70, 60, and 50) and we wanted to honor our colleagues with a birthday celebration. Due to the generosity of faculty members we were able to provide a small gift to our colleagues who have contributed so much to the department, the College, and the University during many years of service.

Left to right: Back row: Prof. Emeritus Phil Kearney, Prof. Steve Robinson, Prof. Bob Leisure, Prof. David Krueger; Front row: Prof. Sandy Kern, Prof. Emeritus Dale Winder, prof. Siu Au Lee, Prof. John Harton

As at many occasions before, the office staff, Bonnie Gillmore, Wendy Gleason , and Kathy Reischauer helped to prepare the birthday celebration. My thank you to all of them.

We were also fortunate that Interim Dean, Prof. Jan Nerger, could join the celebration and congratulate the group.

Bonnie Gillmore, Prof. Siu Au Lee, Prof. Jorge Rocca

Left to right: Prof. Emeritus Phil Kearney, Prof. Steve Robinson, Elisabeth Derbyshire, Dean Jan Nerger, Prof. Mingzhong Wu

Left to right: Elisabeth Derbyshire, Minni Krueger

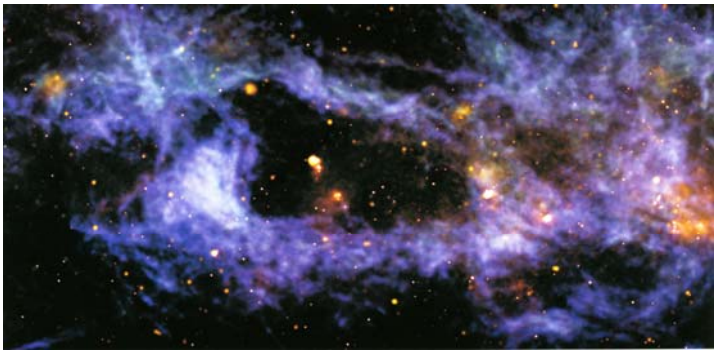
Birthday Celebration in the Department

Prof. Emeritus Dick Etters, Prof. Emeritus Dale Winder, Prof. Roger Culver

Left to right: Prof. David Krueger, Prof. Sandy Kern

Left to right: Elisabeth Derbyshire, Prof. Emeritus Dick Etters, Prof. Roger Culver, Prof. Emeritus Marvin Heller, Prof. Joe She, Dr. Jafar Naqui

Left to right: Prof. Carl Patton, Prof. Bob Leisure, Lucy She, Elisabeth Derbyshire, Prof. David Krueger, Prof. Sandy Kern, Prof. Mark Bradley, Prof. Emeritus Dick Etters, Prof. Roger Culver



Visit of the Delegation from the Wiesbaden University of Applied Sciences at Colorado State University

From May 22 – 28, 2009 a delegation from the Wiesbaden University of Applied Sciences visited Colorado State University to strengthen the existing Agreement of Cooperation between the two universities. Prof. Jochum, who is the exchange coordinator at the Wiesbaden University of Applied Sciences, was accompanied by the Lord Mayor of the city of Ruesselsheim, where the engineering campus is located, Prof. Sobota (Prof. of Electrical Engineering), Mr. Beil (Alumni relations), and Mrs. Hayer (International Office) , and 12 students from the university.

Left to right (front): Michael Ackermann, Mark Kraft, Prof. Christian Jochum, Lord Mayor Stefan Gieltowski, (second row): Marlena Dyzynski, Patrick Goeckler, Christoph Weis, Christopher Limberger,Dorothea Brockmann, Judith Hayer, Prof. Jiri Sobota, Simon Baldewein, (last row): Albrecht Beil, Dominik Mohr, Thomas Kleinwaechter, Philip Fuerst

The program started on Thursday with a visit to the Engine Laboratory

A lunch hosted by the Chair of the Electrical and Computer Engineering Department, Prof. Tony Maciejewski, was the beginning of the afternoon program.

Lord Mayor Stefan Gieltowski enjoys his cookie. Left: Dean of the College of Engineering, Prof. Sandra Woods

Colorado State University

Visit of the Delegation from the Wiesbaden University of Applied Sciences at Colorado State University (continued)

Prof. Maciejewski gives his presentation

Left to right (front): Lord Mayor Stefan Gieltowski, Judith Hayer, Dean Jan Nerger, Simone Clasen, Prof. Christian Jochum, Vice Provost James Cooney; (back): Prof. Jiri Sobota, Prof. Hans D. Hochheimer, Albrecht Beil

Later Vice Provost for International Affairs, Dr. James A. Cooney, welcomed the delegation in the International Office and presented a talk about the education system in the USA.

Friday morning the program continued with a visit of the Department of Mechanical Engineering. The delegation was welcomed by the Chair, Prof. Alan Kirkpatrick who gave an overview about the department .

Left to right: Prof. Alan Kirkpatrick, students of Mechanical Engineering, Lord Mayor Stefan Gieltowski

Lunch was the provided by Profs. Jorge Rocca and Carmen Menoni at the Engineering Research Center followed by a Prof. Rocca's presentation about the NSF Extreme Ultraviolet Laser Engineering Research Center and a tour through the labs.

Prof. Carmen Menoni takes a group photo at lunch

Prof. Jorge Rocca

Visit of the Delegation from the Wiesbaden University of Applied Sciences at Colorado State University (continued)

Beer tasting. Left to right: Lord Mayor Stefan Gieltowski, Prof. Jiri Sobota, Prof. Jochum, Dean Jan Nerger, Penelope Gilliland (our host), Renate Hochheimer

Saturday we visited Boulder followed by a tour of the New Belgium Brewery and a reception in the house of the Mayor of Fort Collins, Doug Hutchinson. All enjoyed the reception and the wonderful homemade strawberry shortcakes prepared by his wife, Cathy Hutchinson.

Most of us had great fun to use the slide in the brewery.

Lord Mayor Stefan Gieltowski coming down the slide.

At the reception in the mayor's house. Left to right: Dean Jan Nerger, Prof. Jochum, Lord Mayor Stefan Gieltowski, Cathy Hutchinson, Mayor Doug Hutchin-

Sunday we visited the Rocky Mountain National Park followed by a barbecue at Dean Nerger's house. There was a general agreement that her husband, Jerry, prepared the best steaks they have ever eaten.

On Monday, Vice Provost of International Affairs , Dr. James A. Cooeney, hosted a lunch in the International Office where the delegation had an opportunity to meet with the directors and employees of

Visit of the Delegation from the Wiesbaden University of Applied Sciences at Colorado State University (continued)

In the Rocky Mountain National Park

Dr. Cooney displays his Scarf.

the International Office and learn about the various exchange programs and possibilities to study here at CSU. Dr. Cooney asked the students of the delegation about their experiences here at CSU and a lively exchange started. Of course, it helped a lot that Dr. Cooney spoke German and displayed his German scarf.

The final event was then a dinner at Young's Café.

On Tuesday we had a final breakfast before the delegation departed to DIA to fly back to Germany.

The student, Christopher Limberger,

Left to right: Dean (College of Natural Sciences) Jan Nerger, Mayor Doug Hutchinson, Lord Mayor Stefan Gieltowski, Cathy Hutchninson, Dean (College of Engineering) Sandra Woods, Prof. Jochum

summarized the experience with a slogan which will probably stick for a long time.

SHORT BUT GOOD

Acknowledgment:

I would like to thank all who have contributed to make this visit a success.

City of Fort Collins, Mayor Doug and Cathy Hutchinson, Jan Nerger and Jerry Tuneberg, Renate Hochheimer, Carmen Menoni, Jorge Rocca, New Belgium Brewery, International Office at Colorado State University, College of Engineering, Department of Electrical & Computer Engineering, Department of Mechanical Engineering, College of Natural Sciences, Department of Physics

Our new PH. D. Richard Cox

Richard Cox successfully defended his thesis *"Nonlinear Spin wave Instability Processes in Hexagonal Ferrites"* on Thursday, April 16, 2009.

Abstract:

Nonlinear Spin Wave Instability Processes in Hexagonal Ferrites

The large magnetocrystalline anisotropy in hexagonal ferrites makes these materials ideally suited for high frequency millimeter-wave applications. However, the large microwave losses observed at low-power levels and the high-power handling capabilities of hexagonal ferrites need to be addressed prior to their wide acceptance in real devices. In order to address the above issues, measurements and analyses of the microwave field amplitude ( ) required to parametrically excite nonlinear spin wave amplitude growth were performed on single crystal easy plane disks of Mn substituted Zn Y-type hexagonal ferrites at 9 GHz and room temperature. Measurements of the dependence on the external magnetic field ( ) were obtained for the resonance saturation (RA), subsidiary absorption (SA), and parallel pumping (PP) spin wave instability configurations. Plots of versus , termed "butterfly curves," were then analyzed for each configuration.

In order to obtain the butterfly curve data and perform the analyses, (1) a state-of-the-art computer-controlled high-power microwave spectrometer was constructed, (2) the classical spin wave instability theory, originally developed by Suhl and Schloemann, was extended, and (3) instability measurements were performed on multiple Zn Y-type hexagonal ferrites samples for several pumping configurations and static field settings. The results constitute the first time RS, SA, and PP spin wave instability measurements and analyses to be performed on the same series of hexagonal ferrite samples. This work also corresponds to the first time that hexagonal ferrite resonance saturation measurements and analyses were performed for static magnetic fields both at and in the vicinity of the ferromagnetic resonance field.

Acknowledgments

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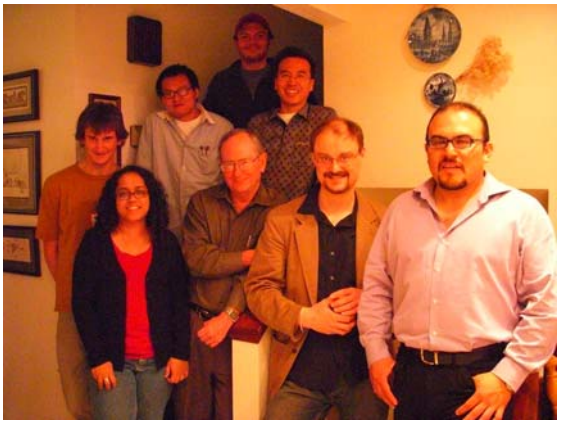
Left to right: Prof. Carl Patton, Richard Cox

Magnetization dynamics group 'farewell party', April 9, 2009



Magnetization dynamics group, L to R: Liam Kilcommons, Sangita Kalarickal, Wei Tong, Carl Patton, Nick Lewkow, Young Song, Pavol Krivosik, Cesar Ordonez

Magnetization dynamics group 'farewell party', April 9, 2009 (continued)

With families for-mer

Prof. carl Patton, Jeanie Patton

NASA astronaut who, in 1983, became the first American woman and youngest

Global Climate Change Meeting at the Denver Convention Center

Some of the greatest scientific minds and the most talented high school students in Colorado gathered on April 14, 2009 at the Colorado Convention Center to learn about the issue of global climate change. The host and principal funder of this event was the Center for Multiscale Modeling of Atmospheric Processes, a National Science Foundation Science and Technology Center focused on improving the representation of cloud processes in climate modeling. The Little Shop of Physics as a CMMAP education and outreach partner, provided direction and programming.

Sally Ride, an American physicist and a

Dr. Sally Ride and Dr. Scott Denning prepare to talk with students

American (at the time) to enter outer space, was there to kick off the event. Ride spent the first 45 minutes talking with the large crowd of students about science of global climate change, sharing her personal observations and pictures. She then moved into an open period for questions for the audience. The question and answer period was moderated by Professor Dave

Global Climate Change Meeting at the Denver Convention Center (continued)

Randall, Director of CMMAP.

The goal of the conference was to educate students on global and local climate issues and to empower them to use their knowledge. Students attended breakout sessions from top scientists on such topics as The Science of Climate Change and Alternative Energy. Other sessions offered included looking at climate change from the standpoints of ethics, culture, policy, construction, and sociology.
The Little Shop of Physics Coordinator of Special Programs with the Little Shop, and Nisse Lee, recent graduate and returning Little Shop intern, hosted three breakout sessions entitled "Atmospheric Adventures" Students who participated in these sessions engaged in science experiments that highlighted the layers of the atmosphere, the greenhouse effect, and energy conservation. The rest of the Little Shop crew hosted students in the exhibit hall where students were able to observe atmospheric processes demonstrated through experiments and science displays.

The conference was attended by over 300 high school students and their teachers. Students identified in post conference surveys that the conference enabled them to make determinations about what they might study in college and the various scientific fields that are engaged in climate change. Students met with representatives from Colorado State University and Northern Colorado University to find out about specific departments and programs that colleges offer.

Mark your calendars for the fourth annual Colorado Global Climate Conference on April 9, 2010 at the Colorado Convention Center in Denver. Plans are to host 500 diverse and high achieving high school students.

Dr Scott Denning, Professor of Atmospheric Science, assists students exploring Climate Connections with the Little Shop of Physics

Christa Koos and a high school student work with the Sand Shaker.

New People in the Department

My name is Alexei V. Dorofeev. I was born in 1976 in Sverdlovsk, USSR, located at the border between Europe and Asia in the Ural Mountains. I moved to Moscow, USSR with my family in 1987, where I got accepted to study at the Moscow Engineering Physics Institute (MEPhI). The last 3 years of my stay there I was working with Prof. Anatoly A. Petrukhin. I participated in the construction, calibration, and testing of electronics and Photomultiplier tubes (PMTs) for the Neutrino Water Detector (NEVOD). NEVOD was the first detector installed on the surface of the Earth and not underground where most of neutrino detectors are. My work there defined my scientific interests (PMTs, atmospheric muons, LEDs and electronics) which continued until now. After graduating from MEPhI in 1999 I decided to join Michigan Tech (MTU), Houghton, MI, USA. At MTU I was working with Dr. David Nitz on first level triggering electronics for the Auger South Surface Detector and also on cascade equations for simulations of inclined extended air showers.

I liked Houghton and the Great Lakes during the summer time, which unfortunately lasts only 4 months per year. It is also one of the few places where you can see amazing Aurora Borealis. It was also the place where I met my wife Sofya. After receiving a PhD from MTU in 2005 I got a postdoc position at Louisiana State University (LSU), Baton Rouge, LA,USA. I arrived at LSU just 2 weeks before the hurricane Katrina. Because of some complicated circumstances I made my way back to Houghton, where in Jan 2006 my twin daughters Anna and Yana were born. I managed to return to Baton Rouge with the whole family only 5 months later. At LSU I worked with Dr. James Matthews on the design of radio coms electronics for Auger North and calibration electronics for the Auger South. Contrary to the Northern Michigan climate I liked the warm subtropical climate of Baton Rouge. In addition the Cajun culture has its own unique flavors which one can enjoy only in Louisiana.

In the beginning of 2009 I've got an offer from Dr. John Harton to work at Colorado State University (CSU) as a postdoc and I accepted it. I'm looking forward to participate in construction of Auger North and the analysis of data from both Auger North & South.

My name is Jackie Schwehr. Hiding out in the basement laboratories of the physics department, I have been here since September '08 working with the high energy physics group. I have been doing a variety of tasks, most of which relate directly to the T2K Neutrino experiment currently being built. I took an interesting route getting here though; I started in California, but only learned about the work being done here during my time in Japan.

I grew up in San Jose, California, and have lived in the Bay Area my whole life, up until last summer. After finishing my B.A. in Physics and Astrophysics at UC Berkeley, I found a profes-

New People in the Department (continued)

sor looking for students to help with a neutrino experiment that he was a part of. This professor, Stuart Freedman, set me and a few other students to Japan to help with the KamLAND neutrino experiment. The collaboration working on KamLAND involved many universities from both the US and Japan, and in my three months there I met quite a few professors from different universities. One of the last people I met before returning home was Professor Bruce Berger, who told me about some of the work he was doing here at CSU. I expressed interest, and shortly after returning to California I was offered a research assistant position here to keep me busy while I applied for graduate school. I packed up and moved to Colorado two weeks after returning from Japan, and I think I'll be staying for a while, though I am currently preparing to return to Japan for 6 weeks to assist with the installation of part of the T2K experiment. Unlike my last trip to Japan, however, I know that when I come back I will be staying where I land, as I plan on pursuing graduate work with the Health Physics Department here at CSU this coming fall.

Martina Zitzelsberger is a 22 years old student from Bavaria, Germany, studying Microsystems Technology Engineering at the University of Applied Sciences Regensburg.

She has just finished her 5th semester and will spend the next five months here in Fort Collins at the Colorado State University.

During this time she will do a practical training in the Photovoltaic Lab of the Physics department working in Jim Sites´ group. The Project will consist of learning the basics of solar-cell measurements, especially current-voltage curves, then applying them to solar panels with many cells, which are intentionally shaded over parts of one or more individual cells.

This is her second practical training which is a requirement of her studies. She absolved her first practical training at Siemens VDO, Regensburg where she was part of a team which developed a monitor system for tire pressure. She was responsible for building up and carrying out experiments to determine the energy behaviour of battery-free wheel units in the laboratory and in a vehicle with the help of dSpace Autobox and LabView. In addition she carried out statistic evaluations of the measurements with Matlab and Microsoft Office.

In her leisure time Martina is interesting in reading books, meeting friends, go swimming, etc.

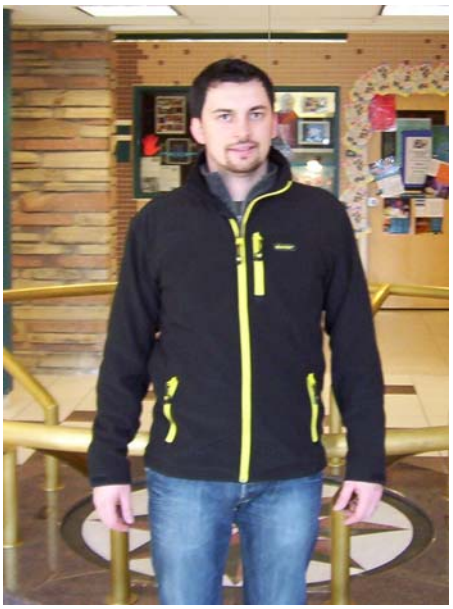
Michael Betz is a 20 years old student from the University of Applied Sciences in Regensburg, Germany. His major is Microsystems Technology Engineering.

He is now in his 6th semester and he is going to stay here in Fort Collins at the Colorado State University till end of July.

He will be involved in nanomagnetism research at the Department of Physics and also assist in measuring the magnetic reversal processes and dynamic excitations in lithographically patterned magnetic structures with micrometer- and nanometer-scale dimensions. Furthermore he will be involved in setting up magneto-optical-based instrumentation for making these measurements.

Within his studies the internship here at the Colorado State University represents his second practical training. He already completed his first internship at Osram Opto Semiconductors GmbH (LLC) in Regensburg. In the Department for Photolithographic Research he worked to introduce a new resist layer for a new galvanic chip procedure to establish large structures. Moreover he processed lots of other research samples.

Besides work Michael is interested in playing and watching soccer, meeting friends, doing some computer stuff and in lots of other things.



Hello my name is Jan Kempinger and I am new at the Physics Department.

I study Electrical Engineering at the Uni-

New People in the Department (continued)

versity of Applied Sciences in Regensburg. During my studies there I have gained some engineering knowledge, beginning with the fundamentals and continuing on to the application of the latest soft- and hardware. Since a few years I have been tutor for Principles of Electrical Engineering and Mathematics at my Department. Now I make my internship here at Colorado State University and after that I write my final thesis to finish my studies.

I come from a little village in the Bavarian Forrest, but since the beginning of my studies I live in Regensburg. In Germany I've been member of a dart team and a volunteer firefighter.

In the next 4-5 month I will be here at the Physics Department in Prof. Harton's group and will try to help as much I can.

My first impression from Colorado State University and the people here is very good and I think I will come home with some good experiences and a lot of new knowledge about another culture and for my studies.