

Physics Newsletter

Baylor University

Department celebrates Homecoming with Alumni

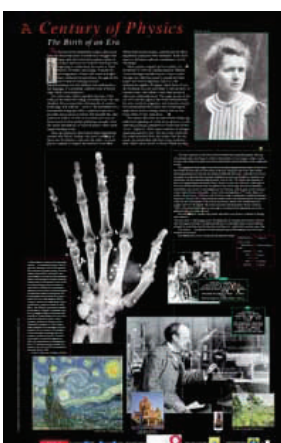
The Department of Physics hosted several activities in conjunction with Baylor Homecoming 2006. In addition to tours of the teaching laboratories (by Linda Kinslow with graduate students Matt Robinson and Chenfang Xia) and research facilities (led by Ken Park) the department also hosted a special Friday Physics Colloquium, *Physics Meets Medicine*, given by Dr. Melissa Miller Blough. Dr. Blough received her B.S. in Physics from Baylor in 1994. She is currently the Associate Director of Medical Physics at the Cancer Therapy and Research Center in San Antonio.

The annual Physics Homecoming Reception followed Dr. Blough's presentation in E.301. The Reception was an interesting mix of the past and the present, displaying both photos of previous faculty and students as well as showing off the new annual departmental newsletter, which was mailed out to alumni this year as part of Homecoming.

Dr. Linda Olafsen also rolled out a new "Shoot the Jayhawk" demo for visitors. The demonstration of gravity's effect on falling bodies will become part of the regular demonstration equipment for introductory courses.



The Department of Physics hosted a special colloquium given by Dr. Melissa Miller Blough (right) as part of Homecoming. She's pictured above with Dr. Lorin Swint Matthews at the departmental reception on Friday, October 20th after the colloquium (part of her presentation is pictured below).



New posters show off Physics history

The halls of the physics department received some dressing up recently, as the department acquired the *A Century of Physics* poster series, produced in 1999 by the American Physical Society to celebrate the Centennial meeting of the physics

society. Spanning the period from 1895 to 1995, the 11 poster series now adorns the wall of the main inner hall of the 3rd Floor E wing of the Physics Department.

The department would like to thank Dr. Linda Olafsen who initiated this acquisition.

Volume 1, Issue 2

November/December 2006

Special points of interest:

- Texas Academy of Science to hold meeting in BSB during Spring '07
- Baylor HEP Experiment gets upgraded at Fermilab
- Faculty submit funding proposals to National Science Foundation
- Department serves breakfast to the Homeless
- Next *First Thursday* Retired Faculty Coffee scheduled for November 2 at 10:30 a.m. in Conference Room

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Second Generation Physics Student

If you've been around the department for many years, and find yourself walking the halls and telling yourself that there's something about our undergraduate, Jon Wilson, that seems awfully familiar, you've got a good memory.

Jon's father is none other than G. Samuel Wilson, who was an undergraduate physics major here at Baylor from 1974-1978. After his degree at Baylor, JSam received a MA from Washington University in 1980 and took a position working on Network Security at Raytheon. (He actually started with E-systems that was absorbed into Raytheon.) Sam's wife, Barbara Ruth

[Green] Wilson also attended Baylor and received her BA in Mathematics in 1978.

Jon himself has been working the last three summers at Fermilab as part of his undergraduate research with Dr. Jay Dittmann in High Energy Physics. Jon is planning on graduating this spring and is applying to graduate school in physics at Ohio State University, where he plans to join his fiancée who is already there in the Linguistics program pursuing her PhD degree.

We look forward to reacquainting ourselves with the Wilson family at graduation this spring!



Does this man look familiar?
It's Sam Wilson (Baylor '78 Physics), father of our own undergraduate physics scholar Jon Wilson.

Strategic Planning Document to Outline Department's Aspirations

The strategic planning process formally began with an announcement by President Lilley at the university faculty meeting on September 11, 2006. Strategic planning promises to be the most important task undertaken by the College of Arts and Sciences for the next decade.

All departments and programs will submit an operational plan, with the

more ambitious plans considered as part of the major strategic process. Major strategic plans will be connected to fund raising initiatives through the Development Office.

The planning process represents an extension of the Vision 2012 initiatives designed to bring Baylor University into the top tier of academic institutions nationally.

"Strategic planning promises to be the most important task undertaken by the College of Arts and Sciences for the next decade."

Alumni Feedback from Monthly/Annual Newsletters

Oh, Baylor Physics!

Why did you have to go and institute a newsletter and send it to me and make me miss you so much!

Professor Olafsen, I am assuming that you probably read this email. I am Amy (Webber) Robertson, former student and now receiver of your newsletter. Just wanted to let you know how much I enjoyed it and what an incredible idea I

think it is. I really do miss Baylor (more than ever after four weeks of graduate school = more stress than ever experienced = higher emotions than usual), and I trust that you are feeling at home in the Department.

I knew how much I loved the people there (and what a special, dear place they still hold in my heart!), but I don't think I realized how rare the community truly is. Treasure it!

I hope we'll meet sometime, as I don't think I can stay away for too long!

Blessings, Amy

With Amy's permission, Dr. Jeff Olafsen has reprinted her email from October 23rd so everyone can see how much they are missed. Thank you, Amy!

Alumni are welcome to contact us at Physics_Newsletter@baylor.edu

Parent's Weekend, September 22-23, 2006

The Department of Physics participated in the Parent-Faculty Coffee as part of Parent's weekend this fall. Due to weather, the function was moved to the Mayborn Museum, but still allowed faculty to interact with their student's parents, siblings and friends.

In the photo to the right, Drs. Jay Dittmann and Linda Olafsen speak with the family of freshman physics major Jon Brown during the morning Coffee event.

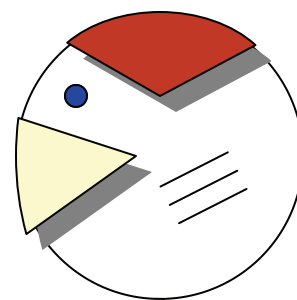
The gathering was quite popular with parents and students alike, and members of the department had several long conversations during the 90 minute event. Drs. John Vasut, Greg Benesh, Dwight Russell, Anzhong Wang, and Jeff Olafsen also participated. Other events associated with the weekend included the football game against Army.



Physics Humor

There is this farmer who is having problems with his chickens. All of the sudden, they are all getting very sick and he doesn't know what is wrong with them. After trying all conventional means, he calls a biologist, a chemist, and a physicist to see if they can figure out what is wrong. So the biologist looks at the chickens, examines them a bit, and says he has no clue what could be wrong with them. Then the chem-

ist takes some tests and makes some measurements, but he can't come to any conclusions either. So the physicist tries. He stands there and looks at the chickens for a long time without touching them or anything. Then all of the sudden he starts scribbling away in a notebook. Finally, after several gruesome calculations, he exclaims, 'I've got it! But it only works for spherical chickens in a vacuum.' - Passed along by Jerry Cleaver



110th Annual Meeting of Texas Academy of Science in BSB, Spring

The 110th Annual Meeting of the Texas Academy of Science will be held at Baylor University March 1-3, 2007. Some 450+ faculty and students from colleges and universities across Texas are expected to attend and many will be presenting research papers in 12 to 15 professional categories. This will be an excellent opportunity for Baylor University to showcase its science faculty and

facilities and on-going faculty/graduate/undergraduate research activities.

To accommodate numerous concurrent sessions, classes will not be scheduled in the Baylor Sciences Building (BSB) that Friday, March 2. Students and faculty are encouraged to attend the presentation sessions. For further information, contact Dr. Robert Baldrige, Department of Biology.

"This will be an excellent opportunity for Baylor University to showcase its science faculty and facilities and ongoing ... research activities."

Mark your calendars and keep these dates in mind as you write your syllabi!

Breakfast for the Homeless

The Physics Department provided breakfast (under the auspices of Mission Waco) for approximately 140 homeless people on Friday, October 27th. The cooks were up at the crack of dawn, arriving at First Lutheran Church at 6 a.m.

A hearty breakfast of eggs, sausage, biscuits and gravy was served beginning at 7:00 a.m. Physics student participants included principal organizer Rachel Harder, Karen Bland, Samantha Hewamanage, Pamela Vo, Eric Bunch, and Matthew Benesh. Physics faculty participants included Jerry Cleaver, John

Vasut, Lorin Matthews, Dwight Russell, Jay Dittmann, and Greg Benesh.

The department would especially like to thank the students for carrying on this service to the community, and Rachel Harder for taking on the administration of organizing the departmental effort. The department's service in this regard was started by Amy Webber (see the email from Amy on page 2) and the event brought back many happy memories to the faculty of her efforts to start this outreach.

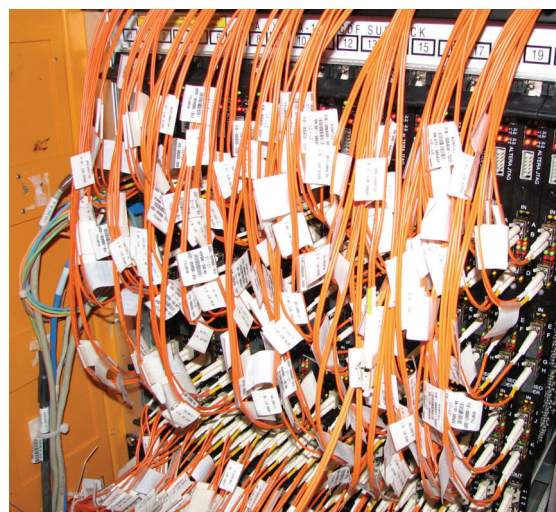
"For I was hungry, and you gave Me something to eat; I was thirsty and you gave Me drink; I was a stranger, and you invited Me in; to the extent that you did it to one of these brothers of Mine, even the least of them, you did it to Me."

– Matthew 25:35 & 40

Baylor Experimental HEP undergoes upgrade at Fermilab

The Baylor Experimental High Energy Physics group has recently completed a major upgrade to the Collider Detector at Fermilab, a 5,000 ton apparatus used to detect the particles produced in high-energy proton-antiproton collisions near Batavia, IL. Working together with physicists from five other universities, the Baylor team finished upgrading the eXtremely Fast Tracker, or XFT, which is used to analyze every collision to search for charged particle tracks. The improved system allows physicists on the CDF experiment to identify high-momentum tracks more efficiently, thereby improving the quality of many physics measurements.

Dr. Nils Krumnack, a Baylor postdoctoral research associate, has been leading the commissioning of the XFT upgrade since the spring. On November 1, he presented a poster on the XFT upgrade at the IEEE 2006 Nuclear Science Symposium in San Diego, California. Together with Dr. Krumnack, two Baylor graduate students (Samantha Hewamanage and Martin Frank) and two undergraduate students (Jon Wilson and Will Brian) have contributed greatly to the XFT upgrade. The group is led by Dr. Jay Dittmann.



Publications

- *Observable/Hidden Broken Symmetry for Symmetric Boundary Conditions*, Gerald Cleaver with B. Dundee and J. Perkins, Int. Jour. Mod. Phys. A **21** (2006) pp. 3367-3386, [hep-ph/0506183].
- *Interactions of Metallo-Phthalocyanine (MPC, M = Co, Ni) on Au(001): A Ultraviolet Photoemission Spectroscopy and Low Energy Electron Diffraction Study*, Trinity Ellis, Ken T. Park, Marc Ulrich, Steve L. Hulbert, and Jack E. Rowe, J. Appl. Phys. in press (2006).
- *Measurement of the Top-Antitop Production Cross Section in Proton-Antiproton Collisions at $\sqrt{s} = 1.96$ TeV* A. Abulencia et al. (CDF Collaboration), Phys. Rev. Lett. **97**, 082004 (2006).

Out and About...

Dr. Jerry Cleaver presented the talk *Ricci Tensors and Scalars for Half-Flat Manifolds*, based on an upcoming paper by Tibra Ali and Jerry Cleaver at Particles, Strings & Cosmology '06, Columbus, Ohio, September 2006. Dr. Cleaver also attended String Phenomenology '06, Santa Barbara, California, 28 August - 1 September. and Metanexus '06, Philadelphia, Ohio, 3-7 June 2006. Jerry presented the paper *Before the Big Bang: String Theory, God, and the Origin of the Universe*. Dr. Cleaver has been invited to present a 30 minute plenary lecture at the Tenth European Meeting "Planck'07" held in Warsaw, June 9 - 13, 2007. The conference, nicknamed Stuartfest, will be held in honor of well-known particle theorist Stuart Raby's 60th birthday. Jerry worked for Stuart at The Ohio State University as a postdoctoral fellow during the period of 1993-1996. Dr. Cleaver will be a featured speaker and the "scientist in residence" at the Evangelical Lutheran Church of America's 2007 Summer Institute, entitled *Faith and Faithfulness: Christianity in the Age of Scientific Discovery*, at Texas Lutheran University, July 9th-13th. Dr. Cleaver has been invited by Nova Science Publishers, Inc. to contribute a 5,000 to 50,000 word chapter to an upcoming scholarly book entitled *Trends in String Theory Research*. Jerry will be writing this during the fall '06 semester. Jerry has also been invited by the British Institute of Physics/Taylor & Francis Publishers to write a review book on String Cosmology. Jerry plans to begin a string cosmology manuscript in the near future, based on his summer and fall research sabbatical studies.

Professors B.F.L. Ward and Scott Yost are traveling to Honolulu for the Joint Meeting of Pacific Region Particle Physics Communities from October 29th to November 3rd. Professor Ward will speak on *Exponentiated Monte Carlo Methods for LHC Physics*, *A UV Finite Approach to Quantum Gravity*, and *Planck Scale Cosmic Rays in Resummed Quantum Gravity*. Professor Yost will speak on *Precision Calculations of Radiative Corrections for ILC Physics*.

Dr. Walter Wilcox's trip to Regina, SK, Canada went well. He gave a seminar/colloquium talk there, entitled *Hadronic Electromagnetic Moments Using Lattice QCD*. The trip took place from October 1st to the 16th. Dr. Wilcox was working with Dr. Randy Lewis at the University of Regina, SK. Dr. Wilcox discussed the results of the Baylor/George Washington/McMurry Universities calculation of electromagnetic polarizabilities and their current calculation at Thomas Jefferson Lab of a new set of quantities called generalized polarizabilities.

Speaking of generalized polarizabilities, this is the main purpose of Dr. Wilcox's current trip to Washington DC. Walter plans to work with Frank X. Lee at George Washington University. This simulation is being done at Thomas Jefferson Laboratory. They are using a new computer language called QDP++ (Quark Data Parallel), which is an extension (superset) of C++. Dr. Wilcox's graduate student Victor Guerrero is developing this project for his Ph.D. Walter is also working with Joe Christensen of McMurry University on this project.

Dr. Jeffrey Olafsen will be traveling to Tampa, Florida to attend the 59th Annual Meeting of the APS Division of Fluid Dynamics from November 19th to the 21st to speak on *Granular Flow in a 2D Couette-Taylor Experiment*.

Dean Darnell moved from Waco to Cupertino, CA to work for Apple. He will return in December to graduate.

Submitted Proposals

In September, B.F.L. Ward, Scott Yost, and Jay Dittmann submitted a Supplemental Grant Proposal to the Department of Energy (DoE) for *Elementary Particle Physics at Baylor*.

Dr. Walter Wilcox submitted a new proposal to the National Science Foundation (NSF) for support for *Strangeness and Polarizability Calculations in Lattice QCD*

Dr. Linda Olafsen submitted a new proposal to NSF entitled *Hybrid Optical and Electrical Pumping for the Development of Mid-Infrared Semiconductor Lasers* in early October.

Dr. Jeffrey Olafsen is currently finishing a new proposal to NSF entitled *Experiments in Non-Equilibrium Steady State (NESS) Systems: Extending Thermodynamics far from Equilibrium* that is due in early November.

Dr. Truell Hyde submitted a proposal to NSF entitled *Baylor REU/RET Site Proposal* in August. This would continue our REU and RET programs.

November 2006

S M T W T F S

			1	2 First Thursday Retiree Coffee 10:30 am	3 Colloquium Yu & Ma	4
5	6	7	8	9	10 Colloquium Katz & Guerrero	11
12	13	14 Undergraduate Committee Mtg	15	16 Strategic Planning	17 Special Colloquium Dr. Neu	18
19	20	21	22 Thanksgiving Break	23 Thanksgiving	24 Thanksgiving Break	25
26	27	28	29	30 Last T/Th Class		



December 2006

S M T W T F S

					1 Special Colloquium Dr. Lautenschlager	2
3	4 Last Day of Classes	5 Study Days	6 Study Days	7 Finals	8 Finals	9 Finals
10	11 Finals	12 Finals	13 Finals	14	15	16 Commencement 10 am
17	18	19	20	21	22	23
24	25 Christmas Day	26	27	28	29	30
31						