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PHYSICS ALUMNI NEWSLETTER

Spring 2006

http://www.swosu.edu/academics/physics ✦ physics@swosu.edu ✦ Terry Goforth, Editor

PHYSICS GRADS NAMED DISTINGUISHED ALUMNI

Now everyone knows what we knew all along. We have some pretty special graduates. This year, two have been singled out for recognition as SWOSU Distinguished Alumni. **John Aaron** ('64) and **Dr. Benny Hill** ('57) will be honored for their many accomplishments at the SWOSU Convocation on May 13, 2006. Keep your eye on SWOSU's News and on the Physics Alumni Web Page for related activities. More information about these high achievers is presented later in the newsletter.

ALWAYS GREAT FOOD! The Physics and Engineering Club Annual Shish-kebab will be held on Saturday, 6 May 2006 at 6:00 p.m. The location will be Dr. Jones' house.

To get to the Jones Estate, take exit 84 (Airport Rd) from I-40 and go south on Airport Road one full mile to the four-way stop. Turn left (east) and go about ½ mile to Cedar Canyon E. (Pass up Cedar Canyon W.) Turn south (right) and drive about 0.4 miles. The sign "JONES 20" will be on the east (left) side of the road. Turn down the driveway. (The house is not visible from the road.) ALUMNI ARE WELCOME!!!

Science is a way of trying not to fool yourself.– Richard Feynman

MELISSA GARD WILL SPEAK AT BANQUET

Take a trip to the International Space Station. For $20 million, you might hitch a ride on a Russian rocket. Or for the much more reasonable rate of $12, you can get a fine meal, the company of friends old and new, and an evening learning about the ISS at the 25th Annual Spring Physics Banquet. This year's gathering will be on Saturday, April 1, at 7 p.m. in the SWOSU Conference Center (at the corner of Davis Rd. and 7th St. across the street from Milam Stadium).

Alumna **Melissa (Missy Dubiel) Gard** ('89) will be speaking on "The International Space Station: What does it do, what have we learned, what's next?"

After receiving a B.S. in Engineering Physics from SWOSU, Ms. Gard started her career at NASA's Marshall Space Flight Center where she performed design, computational analysis and testing on the International Space Station's (ISS) environmental control, life support, thermal and fire protection systems. In 1998 she was temporarily assigned to NASA Headquarters in Washington, D.C. where she worked on Congressional materials related to ISS. Melissa then transferred to NASA's Johnson Space Center where she served as Technical Assistant to the Deputy Program Manager for ISS Operations. Following that assignment she was the Mission Manager for the third and sixth expeditions to the ISS. She is currently a Senior Manager in the ISS Mission Evaluation Room, leading the engineering team that monitors ISS system operations and performs anomaly resolution. Her awards include the Silver Snoopy award -

the astronauts' personal award for ensuring crew and mission safety - and the NASA Exceptional Service Medal.

In addition to food for both body and mind, the evening will include the annual induction of new Sigma Pi Sigma members and presentation of awards and scholarships.

Mark your calendars and make your reservations now. Just let us know your plans–you can always pay at the door. We just need a head count for the caterers about 3 days in advance. Hope to see you there!

PHYSICS AND ENGINEERING CLUB OFFICERS

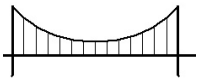
Pres: Moin Khan
VP: Santosh Bhatt
Sec: Bhaskar Basnet
Treas: Micah Perkins
Publ Rel: Michelle Schuldt
Historian: Vishnu Pokhrel
Spn: Dr. Tony Stein

CONGRATULATIONS, GRADS!

This year two SWOSU Physics students received their diplomas at convocation. **Chris Robertson** (Meeker) received his degree in Biophysics and is off to the OSU College of Health Sciences to work on his post-graduate degree in Osteopathic Medicine. **Casey Wells** (Ninnekah) has chosen to pursue an advanced degree in Medical Physics. To further prepare for his studies, Casey has begun his graduate career by picking up additional courses in biology and chemistry here at SWOSU. Casey also continues to serve the SWOSU student body and physics program by using his considerable background tutoring students in beginning physics courses. Congratulations Chris and Casey!

Make everything as simple as possible, but not simpler. – Albert Einstein

THE COLLAPSE OF THE TACOMA NARROWS BRIDGE



Dr. Charles Rogers

The Tacoma Narrows bridge was opened to the public on July 1, 1940. At 1.8 km long, it was the third longest suspension bridge in the world at that time. As originally designed by Clark Eldridge, it would have cost 11 million dollars to build, but eastern financiers would not lend the money to build it unless an engineer of their choice revised the plans. They chose Leon Moisseiff, a world famous bridge designer. A bridge is too complex to calculate all of the forces involved, and so engineers construct a mathematical model relating the forces that they think will be important. Measurements of real bridges, or of physical models, verify that a mathematical model is good and yields the values of constants in the equations of the model. Unfortunately Moisseiff extended his model far beyond where it had been tested. His design called for a visually stunning bridge, a narrow and thin ribbon of roadway gracefully suspended from two soaring towers. Moisseiff's plan would use less steel and cost only 8 million dollars, so his version is the bridge that was built–and besides, Moisseiff was famous.

The bridge's extreme flexibility allowed it to oscillate in the wind and led to its nickname, "Galloping Gertie." At times the roadbed became a sinuous sine wave with amplitudes so large that a car in a valley would disappear from the view of a car in a valley behind it. About 10:00 a.m. on November 7, 1940, Leonard Coatsworth, a news editor for the *Tacoma News Tribune*, drove onto the bridge with the family dog, Tubby, in the back seat. The roadway was rising and falling 3 feet every 90 seconds. Suddenly a stiffening line broke loose and the bridge began to twist

about its center line, pushing the left sidewalk 28 feet below the right sidewalk. Then the left sidewalk rose and the right sidewalk fell, and so on, every 5 seconds. Coatsworth's car was thrown against the curb in the opposite lane, but Coatsworth managed to crawl out a window. The terrified dog would not come.

Not able to stay on his feet, Coatsworth clung to the curb as he crawled towards the East Tower 150 meters away. As he neared the tower, he met Winfield Brown, a college student, who had earlier walked across the bridge for the thrill of the roller coaster effect for the price of the dime toll. They both made it to safety. At 10:30 a.m. a large chunk of concrete dropped from the central span. A short while later the rumble of Galloping Gertie reached a crescendo: the air was filled with the shrieking of twisting steel girders, the sharp gunshot sounds of snapping cables and popping bolts, and the grinding of concrete against concrete. One of the two suspension cables slipped from its saddle atop a tower, and, at 11:02 a.m., a 200-meter-long section of the roadway tore loose from the central span and dropped 65 meters into Puget Sound. Other segments fell and so did Coatsworth's car with Tubby still inside.

At first it was supposed that the bridge's collapse was caused by the wind exciting a natural frequency of the bridge–a resonance phenomenon. Under this guise pictures of the bridge collapse have made it into numerous physics text books. The excitation mechanism was thought to be the formation and shedding of vortices in the lee of the bridge, but the expected period for this was 1 second, not the measured 5 seconds.

Frederick Bert Farquharson, Professor of Civil Engineering at the University of Washington, took measurements and filmed the collapse. He was onsite because he had been assigned to find ways to make the bridge stiffer. (He also managed to reach Coatsworth's car to rescue Tubby, but when he reached inside, Tubby bit his finger and drove him off.) Later Farquharson made a scale model of the bridge and discovered that straight winds could excite a torsional mode with a 5 second period–exactly what had destroyed the bridge. The oscillation frequency was independent of any aspect of the wind, provided that the wind speed was large enough. Once started, the bridge's own structure magnified the motion until the bridge failed. It had previously been assumed that bridges needed to withstand only the pushing force of winds, but Farquharson showed that the complex interplay between the structure and the wind must be accounted for. The field of bridge aerodynamics was born, providing gainful employment for engineers and safer bridges for the public.

In questions of science, the authority of a thousand is not worth the humble reasoning of a single individual.–Galileo Galilei

NEWS FROM CLUB WE-BE-GONE

Travels of the Physics and Engineering Club

The past year has been as eventful as ever. Our spring trip took us to Colorado Springs in the great state of Colorado for the Space Symposium's job fair. It was an eye-opening experience for all of us, particularly our Senior (and some Juniors) who waited in line for the interviews. It was particularly gratifying to see employer after employer emphasizing the importance of on-going education. (Students do not always truly believe professors when we say that an engineering

physics degree doesn't end their education but begins it. When employers and workers in the field speak students listen.) The only disappointment at the fair was the lack of opportunities for international students.

The displays and exhibits at the Symposium were spectacular, as well. They almost competed with the view from the surrounding mountains. Most people were able to fully enjoy the breathtaking view of one of the prettiest parts of our country, but getting down from some of these places was a particularly memorable 'eyes shut' experience for some of us...okay, for one of us (Dr. Stein). There is nothing quite like coasting down a steep mountain having switch back after switch back while smelling the pungent aroma of hot brakes!

Currently we are planning our next spring trip and getting ready for this year's spring banquet. In addition, we are actively seeking speakers to come to SWOSU to present colloquia that give our students a better understanding of what the world is like after they graduate. (See our ad in this paper.)

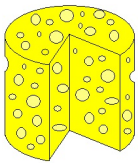
...AND CLOSER TO HOME

The beginning of spring finals heralds the annual Physics and Engineering Shish-kebab. Dr. Jones graciously hosted the 2005 edition which featured beef and chicken kebobs and all the sides and desserts you could ever hope for. The usual round of "questionable" awards were presented, and a fond farewell was wished to our graduating seniors, **Chris Robertson** and **Casey Wells**.

Fall brought a number of new and vibrant students to the Club. At our welcome back barbecue in September we saw a number of new faces and as well as some older familiar ones. The food was great—once it was cooked! (Special thanks goes to **Dr. Robertson** for tutoring a barbecue rookie. (Lesson #1: never be parsimonious with charcoal.)

Following recent tradition, we celebrated Halloween with a spooky movie and plenty of snacks. Of course, the Christmas party provided us with a brief respite from final exams. Students, faculty (current and retired), and families gathered at the home of **Drs. Goforth and Trail** for a wonderful pot-luck spread and a rousting game of Dirty Santa.

HOLES IN THE HOLY HOLES



by Dr. Stan Robertson

In a series of five research papers published over the last four years and a chapter of a book (**New Directions in Black Hole Research**, ed. P.V.Kreitler, *Nova Science Publishers, Inc.*, 2006, ISBN 1-59454-460-3, novapublishers.com) **Dr. Stanley Robertson**, erstwhile SWOSU physics prof, and co-author Dr. Darryl Leiter have proposed a non-black-hole relativistic model of compact gravitating objects. Unlike black holes, their compact object model is allowed to have a magnetic field. They call their object a MECO (for Magnetic Eternally Collapsing Object) and it has been previously described in the Alumni Newsletter. Though compact as a black hole, it never collapses into a black hole because it radiates away its mass fast enough to defeat the formation of an event horizon.

As a result of the extreme relativistic time dilation, this process could continue for trillions of years. For earthbound observers, a MECO would be essentially stable and very dim, hardly distinguishable from black holes except for their magnetic fields. Robertson and Leiter have used the MECO model to explain details of the x-ray spectra and rapid variability of both neutron stars and stellar mass black hole candidates. In a 2004 paper published in Monthly Notices of the Royal Astronomical Society (MNRAS, England), they showed how these spinning magnetic objects could drive astrophysical jets. These ubiquitous jets have been observed for young protostars, white dwarfs, neutron stars and supermassive galactic nuclei. Magnetic objects, such as the MECO can produce them all with infalling, accreting matter and a spinning magnetic field. Typically, the infalling matter forms an accretion disk that interacts with the central magnetic field at the inner edge of the disk. As magnetic field lines entangle in the disk, they are wound toroidally and stretched until there is enough energy stored in a toroid to drive its ejection. Ejection occurs when the axial magnetic field reconnects across the disk. Mass ejections in puffs, somewhat similar to smoke rings blown out, have now been observed in several astronomical jet sources. (For supercomputer simulations and movies (!) of this process for protostars, see **http://astrosun2.astro.cornell.edu/us-rus/disk_prop.htm**) As shown in the simulations for jet-emitting states, the magnetic field of a MECO sweeps the interior of the accretion disk clean, leaving a central hole in the disk, and creates a thin hot inner ring where the disk and magnetic field interact. Additionally, the magnetic field drives disk winds back out over the disk. These can pile up into sizeable "outflow structures" where they impinge on other gas and dust in the less well collimated outer zones of accretion. None of these features are predicted by current black hole models. They are magnetic signatures. Though originally designed for application to stellar mass black hole candidates, Robertson and Leiter showed in the MNRAS paper, that the MECO model could be properly scaled up for application to galactic nuclei.

In a paper recently accepted for publication in the Astronomical Journal*, Robertson and Leiter have joined forces with Dr. Rudolph Schild of the Center for Astrophysics (CFA), Harvard University to apply the MECO model to the explanation of features of a quasar, Q0957+561. Q0957+561 is a compact object, three to four billion times the mass of our sun. Such objects are routinely called supermassive black holes, although no signature properties of a black hole have ever been observed for any of them. Before the MECO model, there were simply no known credible alternatives. Stellar mass galactic black hole candidates primarily produce x-rays and are much too small to be resolved by our satellite x-ray telescopes, but Q0957+561 provides a way to observe the magnetic signatures. It produces multiple images that are a result of relativistic gravitational lensing by an intervening galaxy along the direction of sight. A good example of similar multiply lensed images can be seen for quasar Q2237+0305 (Einstein's Cross) at **http://www.astrouw.edu.pl/~ogle/ogle3/huchra.html** . For Q2237 there are essentially no time delays between arrivals of the four images and the brightness variations are identified as intrinsic quasar brightness fluctuations. But there are significant brightness variations shown at 2950, 3300 and 3700 days since Julian Date 2450000.
Q0957+561 shows comparable behavior that almost certainly betrays the existence of complex internal structure. In addition, there is rich detail on shorter time scales that arises from microlensing by planetary size objects in the host galaxy of Q0957+561. Autocorrelation and cross-correlations between the multiple images and Fourier analyses of these variations of luminosities permits a reconstruction of the major geometric features of the source. The image reconstruction process is somewhat similar to the tomography used in medical

diagnostic imaging. The multiple images produced by the gravitational lens are essentially views of the quasar from opposite sides of the intervening lensing galaxy. This provides a binocular baseline sufficient for resolving the quasar structure. The sizes of quasar source features are commensurate with the time it takes light to travel across them. For example, if a brightness variation occurs in one day, the emitting feature responsible is about one light day in size.

Q0957+561 has been extensively studied for many years, with significant findings previously published by Schild (1991), Pelt et. Al. (1996) Thompson & Schild (1997), Pijpers (1997), Elvis (2000) Oscoz et. al. (2002), Colley and Schild (2003), Schild & Vakulik (2003), and Schild (2005). The "outflow structure" has become known as the Elvis ring and the complex of Elvis ring and a hot interior ring, ten times smaller, but still out at 35 times the Schwarzschild radius and with an empty interior is now called the Schild-Vakulik structure. In addition a small jet centered above the central object is present in the reconstructed image. Furious theoretical efforts to explain how a black hole could produce these magnetic features are presently underway in many of the most prestigious research institutes of the world (especially including CFA!). Additional urgency is added by recent findings that empty inner accretion disks are implied by the best spectroscopic models for jet producing stellar mass black hole candidates. This contradicts the most widely accepted black hole model in which a black hole spinning at maximum allowed rate uses frame dragging very close to the event horizon to eject material from a luminous accretion disk that reaches essentially all the way to the event horizon. For black holes, a new explanation is clearly needed. My personal favorite new black hole model, due to its delightful acronym, MAD, (for magnetically arrested disk) assumes that the disk somehow (tooth fairies?) generates a magnetic ring that drives the jet. But it mistakenly predicts that a steady flow of luminous matter continues inside the magnetic ring. The reason for this is that disk generated fields are necessarily limited to have lower energy density than the kinetic energy density of the disk material orbital motions; otherwise the magnetic field and differential rotation would prevent the formation of a disk. This leaves too little energy available to eject all of the inflowing disk material. The intrinsic central magnetic field of the MECO model circumvents these problems. The bottom line is that we have been able to look closely at a quasar and what we see looks like a MECO. This is a good beginning of the end of the black hole paradigm.

*"Observations Supporting the Existence of an Intrinsic Magnetic Moment Inside the Central Compact Object Within the Quasar Q0957+561", by Rudolph E. Schild, Harvard CFA, Darryl J. Leiter, MARC, Charlottesville, VA and Stanley L. Robertson, SWOSU

SPEAKERS WANTED

Do you have a story to tell? We have an audience for you. Share your hard earned experience and well-seasoned advice with past, present, and future SWOSU graduates. Our students benefit greatly from your involvement. If interested please contact Dr. Stein or Dr. Goforth.

Facts are stubborn things; and whatever may be our wishes, our inclinations, or the dictates of our passions, they cannot alter the state of facts and evidence.–John Adams

A NIGHT OF HONORS

The SWOSU Ballroom was the place and April 9, 2005, was the date of the 24th Annual Physics Spring Banquet. Old friends and new gathered to share delectable delights and an evening honoring past accomplishments and

setting the stage for future ones. Six new members were inducted into the SWOSU Chapter of Sigma Pi Sigma, the honor society of the Society of Physics Students. Signing the book and receiving their pins were Santosh Bhatt, (Jr, Nepal), Moin Khan (Sr, Pakistan), Vishnu Pokhrel (So, Nepal), Chris Robertson (Sr, Meeker), Ashis Shrestha (So, Nepal), and Dr. Wayne Trail (Faculty, Weatherford). This year's J.R. Pratt Award for the Outstanding Student in Physics went to Casey Wells (Sr, Ninnekah), and the Outstanding Midclassman in Physics was awarded to Vishnu Pokhrel. Michelle Schuldt (Fr, Woodward) was selected by her peers as the Outstanding New Physics Club Member. Graduating senior Chris Robertson was presented with his Graduating with Honors Medallion to wear at convocation, and Casey Wells was recognized for his induction into Who's Who.

Through the generosity of alumni, faculty (retired and active), and friends of the Physics Program, over $4,000 in scholarships was awarded to deserving and appreciative students. Receiving the $1,000 J.R. Pratt Scholarship was Moin Khan. The $700 Arthur McClelland Memorial Scholarship was awarded to the winner of the Outstanding Midclassman in Physics recipient, Vishnu Pokhrel. Santosh Bhatt received a $500 Physics Alumni Scholarship and a $250 Arts & Sciences Dean's Scholarship. Four other Physics Alumni Scholarships in the amout of $700 each were awarded to Bhaskar Basnet (So, Nepal), David Chantz Drake (Sr, Elk City), Micah Perkins (Sr, Ponca City), and Ashis Shrestha.

The evening was capped off with an insightful talk by retired faculty member Dr. Stanley Robertson, who brought us into the cosmological debate about the existence of event horizons (necessary to define a black hole) and showed some of the current data and claims being made. He also shared some of his experiences as a "rebel" in the field and the difficulties encountered when trying to publish "radical" ideas. Lessons learned include a reminder that science is based on evidence, and that scientists must be at once both diligently skeptical and open-minded to challenges.

Learning without thinking is useless. Thinking without learning is dangerous.–Kong Fuzi (Confucius)

PAY IT FORWARD

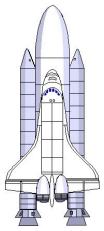
Do you remember trying to make ends meet when you were a student? Do you remember those who were willing to help out?

Tuition and fees continuously rise faster than inflation. In-state tuition is currently $108 per credit hour, and fees are tacked on top of that for certain courses. All told, a typical school year costs about $3,300 in tuition and fees, plus another $3,000 for a minimal room and board plan.

Consider making a tax-deductable donation to the SWOSU Foundation to help support scholarships. If you designate the money to go to one of the Physics funds (J.R. Pratt, Arthur McClealland, or Physics Unrestricted), it will be guaranteed to go to support physics students and the physics program. You don't have to fund a full scholarship yourself. If your schedule prevents you from attending the banquet this year, perhaps you'd like to donate the cost of a ticket ($12) to one of the funds. Every little bit helps, and the power of many donors working together adds up fast! And to those of you

who have made a regular or occasional habit of support, WE THANK YOU!

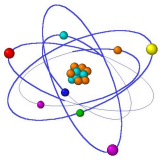
When did ignorance become a point of view? – Dilbert (Scott Adams)



JOHN W. AARON ('64) is being honored this year as a SWOSU Distinguished Alumnus. Mr. Aaron began his career at NASA in the Flight Operations Directorate at the Manned Mission Center (now Johnson Space Center) in Houston. He quickly advanced to become Electrical, Environmental, and Communications (EECOM) officer in Mission Control for the Gemini and Apollo Programs. Among his many contributions, John devised the recovery for the power systems on Apollo 12 after the spacecraft was struck by lightning during launch, thus avoiding a mission abort. He also developed the recovery sequence for powering up the Apollo 13 Command Module to prepare for Earth atmosphere reentry after the CM was shut down to preserve power following a devastating explosion in the oxygen tank. In a 2003 History Channel Documentary "Falure is Not an Option," based on a book of the same title by Eugene Krantz, one controller said "If you ever took a poll on who was the most capable flight controller that ever sat in Mission Control, I believe that most would say John Aaron."

John lead the team of engineers that developed the flight software for the Space Shuttle Orbiter's onboard avionics system and eventually became Chief of the Spacecraft Software Division. He also directed the earliest phase of the International Space Station (ISS) Program and was appointed to lead efforts to streamline and manage JSC's engineering support of the Space Shuttle and ISS Programs. John's leadership lead to better integration of the various NASA initiatives (technology, scientific, robotic, space transportation, and human flight) which provided the foundation for the Human Exploration and Development of Space (HEDS) initiative. His efforts have significantly reduced redundancy between agencies and contracts. He has served as Technical Assistant to the Director of the JSC, Manager of the Space Station Projects, and Manager of JSC Engineering Directorate, Systems Engineering Office.

John retired from NASA in 2000, but he continues to do part-time consulting work. He and his wife Cheryl now live in Marble Falls, TX.



BENNY J. HILL ('57) has been named SWOSU Distinguished Alumnus this year. Dr. Hill received his degree in physics from Southwestern State College under the instruction of the legendary J.R. Pratt. Benny then worked as a research assistant at Los Alamos Scientific Laboratory for two years before returning to SWSC as a physics instructor for one year. He then returned to Los Alamos as a staff member performing computational modeling of various nuclear physics and other processes while taking graduate courses in physics and mathematics from the University of New Mexico. In 1964, he returned as an Assistant Professor of Physics at SWSC and assumed the position of Chair of Physics which he held until 1990 with only a two-year leave from 1966-68 during which he worked on his Ph.D. in the Theory Group at Texas A&M University. Dr. Hill's long and tireless service built the Physics Department at SWSC (later SWOSU) into a nationally-known program which graduated 350 students

during his tenure including 40 who went on to complete advanced degrees in physics, engineering, medicine, optometry, architecture, mathematics, and computer science. Majors in Biophysics and Engineering Physics were added under his leadership, as was the induction of a charter chapter of the Society of Physics Students (locally called the Physics Club and later the Physics and Engineering Club) which has been routinely recognized as one of the Nationally Outstanding Chapters of SPS. He taught most of the courses offered in physics as well as courses in FORTRAN and Scientific Programming for many years. Many of us know of his active participation in placing graduates in jobs or graduate schools, and maintaining relationships with alumni to build a very strong SWOSU Physics Alumni Association that ensured placement of future graduates. Dr. Hill's contributions to science education in Oklahoma went far beyond the SWOSU classroom. He presented computer science lectures for the NSF-sponsored Science Camps at SWOSU. He gave lectures and demonstrations at area schools and for public audiences and encouraged his faculty to do so as well. He also served as a judge for the Oklahoma Junior Academy of Science in Stillwater and at local, region, state, and even international Science Fairs held in Oklahoma.

In 1985, Dr. Hill began part-time corporate defense work for BDM Corporation. Following his retirement from SWOSU in 1990, this became a full-time position where he managed numerous invention, design, manufacturing, testing, and evaluation programs critical to U.S. defense and security, including work on tags and tamper-indicating devices for security in international arms control treaty verification, effects of high humidity on the performance of infrared imagers used by U.S. Border Patrol, assessment of counter-missile systems on U.S. military aircraft and of foreign missile systems, systems for detection of buried land mines, and evaluation and modeling of a variety of systms to detect materials which could be used by terrorists to develop "dirty bombs."

Dr. Hill retired for a second time in 2003. He now resides in Santa Fe, NM, where he is pursuing his interests in history, Indian and Spanish cultures, painting, writing, photography, and as a critic of restaurants in New Mexico.

The whole problem with the world is that fools and fanatics are always so certain of themselves, and wiser people so full of doubts. –Bertrand Russell

A FRESH LOOK

Once again, the first floor of the Chemistry-Physics-Pharmacy (CPP) building is undergoing a major facelift. Last summer we moved out of the north wing so the architects, carpenters, electricians, and plumbers could move in. Classrooms and labs will be equipped with modern network-ready audio-visual capabilities and additional electrical outlets to accomodate an increasing number of notebook computers, and a new student computer lab will be added. Plans also include updating the HVAC systems for greater efficiency. We hope to move back into the wing in time for the start of fall classes. Drop by and check it out!

ALUMNI NOTES

Richard Vaughn ('99) received his MBA from the University of Oklahoma in May, 2005. Congratulations, Richard!

James Bates (‘62) retired from NASA in December, 2004, after many years of service. Jim oversaw many fascinating projects during his tenure at NASA and shared some of them with us as banquet speaker. He has taken up his second career as a piano tuner and as a full-time grandfather. Best wishes, Jim.

Joe Beisel (‘97) is completing his PhD in Mechanical Engineering at Oklahoma State University and is scheduled to defend and graduate this summer. He’s in job hunting mode now, and has had a few interviews. Can we get him a few more...?

Dr. Edwin Green passed away May 3, 2004 at the age of 82. Dr. Green was professor of geology and geophysics at SWOSU from 1975 to 1986. He is greatly missed.

Ron Wollmann (‘73) is putting his chemistry to work as the owner/operator of Panther Hills Winery, located on his home outside of Bessie, OK (just south of Clinton). Ron produces a variety of naturally-fermented wines. Check out his web page at www.pantherhills.com for details including directions, available wines, and tasting room hours.

Loyal Barber (‘82) is co-owner of a software consulting company, BLT Soft Incorporated (www.bltsoft.com). This father-son company specializes in the installation and modification of Retek, a software package used in retail merchandising to control items, pricing, purchasing, etc., for the home office.

Eric Brown (‘95) is now Director of Engineering Technology for Silicon Valley Expert Witness Group. SVEWG specializes in providing highly qualified scientific and technical experts in intellectual property and other litigation matters to law firms nationwide. Eric says the job is interesting and allows him to bring his background in science, engineering, and business together in a challenging and fun way.

Terry Cox (‘86) is employed with Seimens Transportation Systems. Terry visited SWOSU and gave an informative talk about his career in system operations to the students in April 2004. He opened some eyes to the possibilities of careers that don’t have the word “physics” in the job description. Thanks, Terry!

Lee McClune (‘69) dropped by on December 19, 2005. He was in the area to talk to economic developers about his Sorganol endeavors.

Adam Fisher (Faculty ‘96-‘98) is now in the Minneapolis area working with BAE doing software architecture for the Army's FCS program.

Ross Giblet (‘04) is a “Frac,” or Technical Professional in Production Enhancement, for Halliburton. For those of us unfamiliar with Petroleum Engineering, thousands of gallons of gel are pumped into the ground at high enough pressures (up to 20,000 psi) to put a huge fracture in the ground where the hydrocarbons are. Then a mixture of sand and gel is pumped in to keep the fracture open. Ross’ job is to make sure that the fluid system behaves properly by monitoring pressures, rates, and leakoff. After completing six months of intensive training at the Tecnical Excellence Center in Alice, TX, he’s back in western Oklahoma and on the job.

Mike Alsobrook (‘86) works for the Department of the Navy at the Patuxent River Naval Air Station where he is program manager for installation of the the Tomahawk Weapon System on Trident submarines which are being converted to carry Tomahawks instead of ICBMs.

Lucas Weber (‘04) visited the department last spring, fresh from the Navy Nuclear School. We later welcomed Lucas on a recruiting visit to educate science majors on career opportunities with the U.S. Navy.

A witty saying proves nothing.– Voltaire

LET US KNOW WHAT YOU'RE UP TO!

It's our great pleasure to prepare this newsletter and to share with you what we and other alumni are doing. Your friends from good ol' SWOSU would love to hear about YOU. Keep us up-to-date, and we'll pass it on. Of course, we especially need to keep up with your addresses (email for quick contact and snail mail just to send you the newsletter). Be sure to let us know when things change so we don't lose touch.

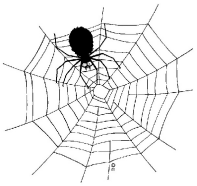
WE'RE EASY TO FIND

You can send mail to us at 100 Campus Drive, Weatherford, OK 73096-3098, or e-mail us or call us at

Dr. Terry Goforth	(580) 774-3109	terry.goforth@swosu.edu
Dr. Charles Rogers	(580) 774-3108	charles.rogers@swosu.edu
Dr. Tony Stein	(580) 774-3107	tony.stein@swosu.edu
Dr. Wayne Trail	(580) 774-3124	wayne.trail@swosu.edu
Mary Lou Scouten (Secretary, Department of Chemistry & Physics	(580) 774-3266	marylou.scouten@swosu.edu

or just send your e-mail to physics@swosu.edu. We'll see that it gets to the right person.

AND DON'T FORGET WE'RE ON THE WEB



You can find us at www.swosu.edu/academics/physics. Click on the Alumni link for the newsletter (past and present) and other news.

ALUMNI EMAIL ADDRESSES*

*If you are a SWOSU Alumnus, drop us an e-mail at physics@swosu.edu and we'll send you the complete list of alumni e-mail addresses that we have on file.

PHYSICS ALUMNI BANQUET 2006

Saturday, April 1, 2006 7:00 p.m. SWOSU Conference Center $12/person

Name _____ No. Persons Attending _____

Address _____ Phone _____

_____ Email _____

Please return to: Dr. Tony Stein ✧ 100 Campus Drive ✧ Weatherford, OK 73096

SHISH KEBAB 2006

Saturday, May 6, 2006 6:00 p.m. Dr. Jones' home $5/person

Name _____ No. Persons Attending _____

Address _____ Phone _____

_____ Email _____

Please return to: Dr. Tony Stein ✧ 100 Campus Drive ✧ Weatherford, OK 73096

Or... just give us a call or e-mail us to confirm for either/both event(s).

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