Department of Chemistry & Physics ✦ 100 Campus Drive ✦ Weatherford, OK 73096-3089

PHYSICS ALUMNI NEWSLETTER

Spring 2012

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

MARK YOUR CALENDAR

Spring is a time of renewal as the grass greens, daffodils poke their heads above the earth, and trees begin to bud. We also find ourselves thinking about renewing old friendships and maybe making a few new ones. The Spring Physics Alumni Banquet is a great place to do just that. Please join us on Saturday, March 31, 2012, at 7:00 p.m. in the Student Union Ballroom for dinner and a chance to honor and reward our students for their hard work and success. We will also be honoring **Dr. Charles Rogers** who, after 40 years of service to SWOSU, will be retiring at the end of this semester. Our speaker for the evening will be alumnus **Brian Stephenson** ('92) who is currently the COO and President of Tronics MEMS, Inc. in Dallas. Tickets are $15 per person and may be paid for at the door. We need to notify the caterer of a head count in advance, so we request that you make your reservations in advance.

The science of today is the technology of tomorrow.
~Edward Teller

BRIAN STEPHENSON

Brian Stephenson ('92) graduated from SWOSU in 1992, with a degree in Engineering Physics. Since then he has worked in the semiconductor industry, accumulating over 20 years of engineering and management experience. Prior to joining Tronics Brian was Senior Engineering Manager at STMicroelectronics where he managed teams working on high volume, integrated MEMS processes. He has also held various process engineering and management positions with TI, WaferTech, Ebara Technologies and Novellus Systems. Brian currently resides in Highland Village, Texas, with his wife, Rachelle (née Cole, also a SWOSU physics alum) and three children, Lauren (15), Michael (13) and Elizabeth (7).

FUN IN THE SUN

You know how good the food is. You know how much there is. You remember the fun. So why don't you join us for the Physics Shish-kebab at Crowder Lake on Saturday, May 5? Food will be served up around 6 p.m., but come on out early. The scenery is gorgeous, the wildlife abundant, and nature trails beckon. Canoes are available at no charge, and you can fish if you have a valid Oklahoma fishing license. Of course, you're also welcome to just relax and visit or get involved in a game or two of volleyball. As if that's not enough inducement, we'll be initiating new officers with the usual array of creative oaths and presenting awards that weren't quite ready for the banquet! No reservations required (although a rough head count helps with the food planning).

In all science, error precedes the truth, and it is better it should go first than last.
~Hugh Walpole

PHYSICS AND ENGINEERING CLUB OFFICERS, 2010-2011

President: Michael Moore
Vice-Pres: Cal Humphrey
Secretary: Wil Markus
Treasurer: John Saluke

STEPPING OUT

Engineering Physics major **Stephen Duerr** (Sr, Foss) walked across the stage and received his degree in the May Convocation ceremony. Congratulations, Stephen!!

No amount of experimentation can ever prove me right; a single experiment can prove me wrong. ~Albert Einstein

DR. ROGERS WINS BERNHARDT AWARD

Dr. Charles Rogers was presented with the prestigious Bernhardt Academic Excellence Award for 2011. Rogers, professor of physics in the SWOSU Department of Chemistry and Physics, was honored at the annual Bernhardt Award Banquet held March 31, 2011, in the Memorial Student Center on the SWOSU campus in Weatherford. For winning the award, Rogers received a $2,500 cash award, a Waterford crystal clock, and an engraved pen set.

SWOSU alumni Dr. William and Theta Juan Bernhardt of Midwest City are sponsors of the annual award that goes to an outstanding faculty member who exhibits exceptional achievement in teaching, scholarship and service.

DR. CHARLES W. ROGERS TO RETIRE

After 40 years of service to SWOSU, Dr. Charles Rogers will retire at the end of this school year. Dr. Rogers came to Southwestern Oklahoma State University in 1972 on a one-year temporary appointment and, 40 years later, is still teaching in the classrooms of SWOSU.

In junior high school, Rogers came across the book Explaining the Atom by Selig Hecht, and he was absolutely enthralled to learn how many things can be explained by knowing about the atom. He was hooked and knew he wanted to become a physicist.

After high school graduation, Rogers went on active duty with the Utah National Guard. He joined the Guard because he felt that he owed service to his country. He spent eight years in the National Guard, eventually becoming a senior radar operator in an artillery target acquisition battalion. He also took three years from his studies to serve as a missionary in Germany (he was there when the Berlin Wall was built).

Rogers graduated from the University of Utah in 1965 with a B.A. in physics. He then attended Oregon State University where he received an M.S. in physics in 1968 and a Ph.D. in experimental nuclear physics in 1971. He spent one year as a visiting assistant professor at Louisiana State University before coming to SWOSU.

At SWOSU, Rogers has taught 32 different courses. He teaches an average of 200 students each year, meaning he has taught over 8,000 students during his 40 years at the university. He has served on a number of campus committees and was active in Faculty Senate for 20 years. He was chair of the Faculty Senate's Judicial Committee for several years and vice president of the senate for one year. He has served on the Radiation Safety Committee for his entire 40-year tenure and is currently the chair.

Rogers has written around 100 articles on subjects from Nobel Prize winners to nuclear weapons. Rogers was the technical editor for two encyclopedia volumes and for a set of children's encyclopedias. He has conducted numerous observatory viewing sessions for area public schools and the general public and has been

guest speaker on such topics as astronomy, nuclear war, the dangers of too much UV and the so-called "ancient astronauts."

Rogers has served 40 years as a leader in the local unit of the Church of Jesus Christ of Latter-day Saints, including 7 years as the leader of the congregation. He is an ordained minister and has spent huge amounts of time with welfare cases. He is also active in the SWOSU community chorus.

He married wife JoAnne in 1969, and they have three daughters who are now grown and have families of their own.

BANQUET 2011

On a pleasant Saturday last April, some 50 alumni, students, faculty, administrators, family, and friends of the Physics Program gathered in the SWOSU Student Center Ballroom for an evening of honors, awards, and celebration. The festivities began with socializing and dinner, followed by the induction of **Johathan Brooks** (So, Weathford) and **Micah Webb** (So, Altus) to the SWOSU Sigma Pi Sigma Chapter. **Micah Webb** was also recognized as the Outstanding Midclassman in Physics, and the JR Pratt Award for the Outstanding Student in Physics was awarded to **Cal Humphrey** (Jr, Rocky). Following the presentation of scholarships (detailed below), **Dr. Ken Duerksen** ('66), who is retired from Tokyo Electronic, Limited, entertained, inspired, and educated us with some of his experiences during and since his time at Southwestern. Ken's lessons highlight the fact that with hard work and dedication, an education in physics from SWOSU can take you anywhere you'd like to go.

Alumni in attendance were **Ken Duerksen** ('66), **James Brooks** ('88), **Benny Hill** ('57), **Wendell Riseley** ('81), **Wessley Lamoreaux** ('10), **Jonathan Wallace** ('09), **Justin Silkwood** ('10), **Chantz Drake** ('06), **Stan Powers** ('57), and **Terry Goforth** ('81).

SUPPORT THE FUTURE

Through the generous support of alumni, friends, and sponsors, we presented over five thousand dollars in scholarship support to deserving physics students. Each year, Chesapeake Energy sponsors two $1,000 scholarships for Engineering Physics majors. Last year, the recipients of the Chesapeake Scholarships were Michael Moore (Jr, OKC) and **Dylan Frizzell** (Fr, Mountain View). **Scholarships supported through donations to the SWOSU Foundation and earmarked for Physics were also presented. The Arthur McClelland Scholarship for $750 was awarded to Shawna McCoy** (Fr, Hydro). **Wil Marcus** (So, Kingfisher) **received $1,000 for the Ray C Jones Scholarship. Our premier scholarship, the JR Pratt Scholarship, for $1,500 was presented to Cal Humphrey** (Jr, Rocky).

This type of financial support is often the difference in a student's ability to stay in college and/or continue to meet his/her true potential. Rising costs for tuition and fees ($153 per hour this year at SWOSU), books (typically $100-$150 each), and living expenses make it a challenge for today's students to be full-time students without also working a full-time job. As physics degree holders, we all know that studying physics is not a part-time endeavor. It requires many hours of study and homework each and every week to master the subject, and time spent serving pizza is time taken away from such academic pursuits. Your tax-deductible donations insure that these budding physicists and engineers are able to focus on their education. You are truly making an investment in the future. Thank you so much for your continued support!

LAKESIDE RETREAT

The Physics Division's annual mid-finals-week celebration was held at Crowder Lake on April 30, 2011. Delicious food (as always) along with volleyball, induction of the new Physics Club officers, and, of course, the Iggy (Ignoble) awards provided fun and entertainment while everyone had a chance to visit and relax.

WAY TO GO, DOC!

Dr. Tony Stein reached a milestone this past year when multiple committees and administrators all agreed to grant him tenure. Congratulations, Dr. Stein!

We can lick gravity, but sometimes the paperwork is overwhelming. ~Wernher von Braun

LEARNING BY DOING

The 2011 SWOSU Student Research Fair was held on April 12, in the Student Union Ballroom. Two Physics and Engineering students showed off their work at this event. **Wil Marcus** (So, Kingfisher) presented preliminary results from his spectroscopy work at the SWOSU Observatory. His work involves software layering of multiple digital photographs of an astronomical objects to enhance the object and remove the "noise" from the final image. **Micah Webb** (So, Altus) reported on the results of his study of sorting statistics.

The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!' but 'That's funny…' ~Isaac Asimov

HOUSTON, DO YOU READ?

On October 14, 2011, the Stafford Museum opened a new display honoring SWOSU graduates who have worked in NASA's Mission Control during the Mercury, Gemini, and Apollo programs. James Bates ('62), Bill Bates ('67), Ron Toelle ('63), Robert Holkan ('63), and Tom Weichel ('64) were honored guests at an Oktoberfest event. General Thomas Stafford personally gave a tour of the museum to invited guests. The tour was followed by a dinner, a talk by Bill Moore, author of Oklahomans in Space, and a few remarks by Jim Bates. If you get a chance to visit Weatherford, be sure to check out the Stafford Museum (AAA calls it a "Gem").

OPEN HOUSE

On November 29, 2011, Dr. Marco Cavaglia, Assoc. Prof. at the University of Mississippi presented a public talk entitled "All Black Holes: Great and Small" at the Stafford Museum. Following Dr. Cavaglia's presentation, Drs. Stein and Trail opened the SWOSU Observatory to host a star party for Stafford Museum guests. SWOSU students, faculty, and staff, Weatherford residents, and other guests from as far away as OKC enjoyed the lecture and the chance to see a number of astronomical objects through SWOSU's telescopes.

Earlier in the month, the SWOSU Observatory was prepared to open to the public so folks could see the passing of Asteroid 2005 YU55, which swung by Earth at a distance of 202, 000 miles on November 8. We were ready and willing, but the weather refused to cooperate as cloudy skies prevailed. Perhaps we'll try again the next time YU55 makes a close pass–in 35 years!

Science is simply common sense at its best, that is, rigidly accurate in observation, and merciless to fallacy in logic. ~Thomas Huxley

PHYSICS LIGHTNING RESEARCH

SWOSU engineering physics senior **Michael Moore** (OKC) continued the lightning research program, under **Dr. Stein**. Using an extension to the three-year NASA grant, they purchased two low-light cameras and the supporting hardware and software to observe sprite lightning that occurs in the upper atmosphere above storms after a strong lightning discharge. Michael observed and photographed sprites from Weatherford and correlated them to a storm above Kansas. He presented his results at the Oklahoma Research Day.

SOLAR SPECTROMETER PROJECT

Due to strong interest by the students, **Dr. Stein** and **Dr. Trail** assisted students in the beginning stages of designing a solar spectrometer. The meetings were well attended with four to eight students at each meeting. The students built simple spectrometers and analyzed the spectrum of a Neon bulb. The advantages and disadvantages of various designs were discussed and parts were ordered for a more ambitious future project.

PHYSICS AND ENGINEERING CLUB ACTIVITIES

by Dr. Tony Stein

The physics club continues to be an active and important part of our students' development. Highlights from the past year include field trips, hosting activities on the SWOSU campus, and other social and professional meetings.

The Physics and Engineering Club took a spring trip last year to the Johnson Space Center (JSC) in Houston, Texas. Seven engineering physics students were able to participate. In addition to an inside tour of the facilities, the student learned from researchers in their field about radiation exposure in space, how the moon rocks are preserved and stored, and about mission control at JSC. The trip was capped off with a trip to Galveston Beach.

Physics Day was very well attended this year with 140 students from 14 different high schools in western Oklahoma. The high school students were treated to a broad range of fun and informative physics demonstrations over a three-hour period. As usual, the Physics and Engineering Club was a vital part, guiding students from station to station and running a station of their own. **Drs Goforth**, **Rogers**, **Stein**, and **Trail** ran the other stations that covered almost every area of physics.

In addition to the solar spectroscopy design covered elsewhere in this newsletter, the Physics Club hosted a number of events to encourage student research at SWOSU. A physics research information meeting was held at the beginning of the school year to discuss the various research opportunities available. Additional events were held at the astronomical observatory to introduce the students to the night sky and the telescope and to demonstrate how our spectrograph works by taking the spectrum of a star.

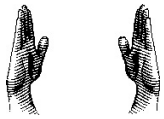
The Physics Club held a contest to design a paper object that would fall as slowly as possible and then hit a target on landing. The winner was decided by the best ratio of fall time to distance from target. First place was claimed by **Brian Koehn** (So, Corn) and second was taken by **Shawna McCoy** (So, Hydro). Both earned free Physics Club T-shirts from past years.

The year would not be complete without the various social meetings hosted by the Physics Club. We had good weather for our year-

end shish-kebab. The welcome-back hamburger fry was well attended as was the Holiday Christmas party which was hosted by Dr. Goforth and Dr. Trail. This year the Halloween party was held jointly with the Chemistry Club.

The fewer the facts, the stronger the opinion. ~Arnold H. Glasow

SIMPLE SCIENCE PROJECT
by Dr. Wayne Trail



In 2012, SWOSU will host its 9th ExxonMobil Bernard Harris Summer Science Camp. Fifty 6th-8th graders will spend two weeks on SWOSU campus doing hands-on/minds-on activities. In lieu of the usual survey of last year's highlights, I am giving you a science activity. Many of our camp activities use computers, robots, and other electronic equipment. However, we also have several like this one in which the students, using very simple tools, can do some surprising things.

In this activity we will measure the distance to faraway objects using parallax. For a simple example of parallax, extend your left arm in front of you horizontally and give the "thumbs up" sign. Look at your thumb with your left eye (right eye closed) and line the thumb up with an object on a wall across the room. Then "switch" eyes. See how the thumb appears to move? When looking at your thumb at the end of your arm, the parallax angle is the right-eye to thumb to left-eye angle. For most people this is about five to ten degrees. The "base" of the triangle is the distance between your eyes. In astronomy parallax measurements on nearby (ha!) stars (called *stellar* parallax) are the foundation on which all of our astronomical distance measurements are based.

In stellar parallax measurements, the equivalent to "switching eyes" is waiting six months and looking at the same star from the opposite side of the Sun, so the Earth's orbital diameter forms the base of the triangle. Using this method, the parallax angle for the nearest star is about 0.0005 degrees. And that's the *nearest* star. Even so, recent spacecraft such as Hipparcos and Kepler have given us hundreds of thousands of stellar parallax measurements. They only work on our nearest neighbors, but we have lots of neighbors!

In this activity you will need a partner, a meter stick, and a pencil. We are going to measure the distance to less remote objects using parallax. *Figures referred to are on Page 12.*

Here is the procedure:
1. Measure the width (across the finger with the nail facing you) of your left pinkie (in *cm*) maybe ¼ inch below the tip of your finger (take care not to press your pinkie against the ruler making it measure wider than it is). (*Figure 1*) Then make a fist and measure its width (also in cm) just below the tops of the knuckles. (*Figure 2*)

Pinkie_____(*cm*)
Fist_____(*cm*)

2. Now, with your left arm held horizontal straight out in front of you, and with (just) your pinkie pointed straight up (so that you are looking at the nail), have someone measure the distance (in *cm*) from your left eye to the pinkie nail. (*Figure 3*) You will be holding your pinkie out like this to measure the angular sizes of distant objects.

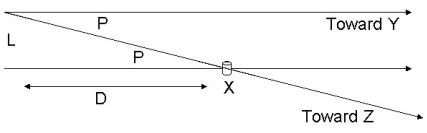
Eye-to-pinkie_____(*cm*)

3. Now, with your left arm still straight out in front of you, make a fist and try to bend your wrist so the back of your hand is as vertical as you can make it while still holding your arm straight out. Have someone measure the distance from your left eye to your knuckles. (*Figure 4*)

Eye-to-fist_____(*cm*)

Using the information you accumulated above, you can make crude angular measurements of distant objects. My results above are Pinkie=1.5 *cm*, Fist=9.0 *cm*, eye-to-pinkie=70 *cm*, eye-to-fist=63 *cm*. The angular size of my pinkie in radians (as viewed from my eye is 1.5 *cm*/70 *cm*=0.021 radians=1.2°. Similarly, the angular size of my fist is 9.0 *cm*/63 *cm*=0.14 radians=8.2°. I can now use my pinkie and fist to measure the angular sizes of objects.

Now go to a place where you can see distant objects on the horizon (this might be easier to do in Oklahoma than where you live). If you have access to an upper floor in a building, that is almost ideal.
Pick an object (call it X) that is reasonably far away (could be 50 feet, could be miles), but is much closer than the objects on the horizon. This is the object we'll be locating. Make sure however, that there is something behind X that is much farther away (at least four or five times farther away).
1. Line X up with a distant object behind it; maybe a distant tree, building, or mountain. We'll call the background object Y. Mark your position on the ground with chalk or a rock.
2. Now move in the direction perpendicular to the line connecting you and X until X lines up with a distant object called Z (a different tree, building, mountain, etc.). We need Y and Z to be at least a pinkie-width apart, preferably more, but let's keep it below a fist.
3. The angular separation between Y and Z as measured by you with your pinkie and/or fist is the parallax angle, P.
4. With your meter stick measure the lateral distance, L, between your observation points for Y and Z.



5. The distance, D, from you to your object X, is solved by the small angle formula P=L/D, so that D=L/P is the distance to object X where we use the radians measurement for P. We tested this with a large group and got about 10 percent accuracy (on average) on an object that was about a mile away. With some practice and some care in making the initial pinkie and fist calibrations, you can get surprisingly good results.

A fact is a simple statement that everyone believes. It is innocent, unless found guilty. A hypothesis is a novel suggestion that no one wants to believe. It is guilty, until found effective. ~Edward Teller

ADDRESS GIVEN AT THE WHO'S WHO RECEPTION FEBRUARY 2012

by Charles Rogers

I congratulate you on being selected as Who's Who recipients for 2012. Presumably you know not only who's who, but what's what, when to say when, and where Waldo is. If I tell you that I am going elsewhere, you might reply, "whatever," but if I say that I am going else when, it might spark your interest. We move at will along three spatial dimensions: North-South, East-West, and up-and-down, but we all move in lock-step into the future at the rate of one second per second.

We could change that if we wanted. Well, we could if we had enough energy. If I had all of the electrical energy generated in one year in the United States, it wouldn't be enough. I would need a little bit more–ok 52 million times that, and if I could magically transfer it to the space shuttle (with needing to haul fuel along), I could accelerate all of the two million kilograms of the shuttle to 0.999 999 99 times the speed of light. Then time would pass at a different rate on the shuttle than it would here on Earth. A trip of ten years on the shuttle, going out and returning to the Earth, would take ten thousand years as measured on the Earth. The shuttle would land on Earth ten thousand years in Earth's future. This was the premise in the original *Planet of the Apes* movie, and it is absolute fact. We have measured this effect, on a far smaller scale, of course.

The real universe is a fascinating place. You will probably not remember much that I say today, so I will give you some snappy quotes that you might remember. In words attributed to British astrophysicist Sir Arthur Stanley Eddington, **"not only is the universe stranger than we imagined, it is stranger than we can imagine."**

Let me tell you a little about John, my best friend as I was growing up. He was fun to

be with. He held the high school state record for the javelin, and one day I asked him if he could throw the javelin accurately or just far. He pointed to a sheet of paper at least fifty feet away on the lawn and launched the javelin on a high arc. It stood up where it hit, pinning the sheet of paper to the ground. Yes, he could throw the javelin accurately.

We were in the same National Guard unit. The unit was activated when the Berlin wall was built, but I was already in Germany serving as a missionary. The West Germans figured the Russians were up to their usual tricks and didn't see the wall as leading to World War III. They seemed a lot less excited about the wall than the folks back home.

John went with the guard unit to Texas where they trained for about a year. As the months dragged by, the sixth army decided to hold a triathlon to build morale. John made it to the finals. Before the swimming event, John promised himself that whatever happened, he would at least keep up with the swimmer next to him. As the race got underway, a quick glance showed that the swimmer in the next lane had red and white trunks, and he was even with John–maybe even a little ahead. Throughout the race the red and white trunks stayed even with John, no matter how hard he tried to get ahead. As they approached the finish, the crowd was on their feet yelling and screaming. John gave one final effort and touched the wall. When he looked for the other swimmers, there was no one within twenty feet of him. The red and white trunks turned out to be the floats holding up the rope!

John enjoyed his time at the university so much that he was soon on academic probation, and then asked not to come back for a while. A couple of years later, John decided to be a serious student, and although he got all As and Bs, it wasn't enough to remove him from probation, so he was dismissed again. John lined up a high-paying construction job in Alaska, but just before he left for Alaska he got a letter from the University saying he had been reinstated. John turned down the high-paying job and went to register at the University, but they told him the letter had been sent by mistake. This did not make John happy. He shared his unhappiness with enough administrators until they allowed him to come back with the provision that he keep his grades above 3.5. He did. John went on to get a master's degree and had a very successful career as a physical trainer at West Point. The pithy quote here is, **"Work will win when wish-washy wishing won't."**

Have you ever made plans to study or to write a paper tomorrow, but today you watch football or a movie or you party? Then tomorrow comes and you get sick, or your car breaks down, or a wife, or a child, or a friend really needs attention. Pithy quote, **"life is what happens when you have already made other plans."** The best defense is to do what needs to be done at the first opportunity, you may not get another.

I have one final saying for you. I use it when storm clouds gather and the pressure just gets to be too much: **"when in trouble or in doubt, run in circles, scream and shout!"**

To review: the universe is a fascinating place, **"It is not only stranger than we imagined, it is stranger than we can imagine."**

"Work will win when wish-washy wishing won't."
"Life is what happens when you have already made other plans."
and **"When in trouble or in doubt, run in circles, scream and shout!"**

Thank you for this opportunity to address you.

Every great advance in science has issued from a new audacity of imagination. ~John Dewey

NEW MANAGEMENT

Dr. Radwan Al-Jarrah, Dean of Arts & Sciences, announced his retirement this year. Dr. James South has been named Interim Dean while a search is conducted for Dr. Al-Jarrah's replacement.

SHAKE, RATTLE, AND ROLL

Yep! We felt it! The record-breaking 5.6-magnitude earthquake centered near Sparks, OK (east of OKC) on November 5, 2011, shook the ground in Weatherford. It gently rocked houses, a few shelves, and some nerves, but no damage was reported here.

WHAT'S UP WITH YOU

Joanna Blevins ('01) is currently Principal Business Analyst for SIRAS (a Nintendo subsidiary) in the Seattle, WA, area.

Lucas Weber ('04) has been serving our country in the Navy. Since completing the naval nuclear power school in 2006, he has been stationed in Hawaii assigned to the USS Los Angeles and then in Japan stationed on an Amphibious squadron staff. His work includes training marines, doing exercises with allied navies, and a fair bit of humanitarian aid. Lucas was involved with helping the Philippines after a major hurrican in 2010, assisting the South Koreans in recovering the ROKS Choenan after it sank, and assisting in Japan after the earthquake and tsunami in 2011. He is currently stationed at the Navy Yard outside of Washington, DC where he is manager of the testing program for submarine combat control systems.

Paul Schneider ('97) completed his residency training last June and began working full time as a staff psychiatrist at Green Oaks Hospital in Dallas. He became board certified by the American Board of Psychiatry and Neurology last September.

Craig Huffman ('83) moved from Imec in Belgium to Sematech in Albany, NY, last June. He has worked with Sematech in the past as an assignee from TI, and now he is a direct hire to Sematech working on dry etch processes.

Santosh Bhatt ('06) is working to finish his dissertation this spring and hopes to defend his work in April and graduate from the University of Tennessee in May. He is applying for jobs and post doctoral positions.

BE A PART OF HISTORY

Dr. Benny Hill ('57) is compiling a history of the SWOSU Physics Department, including stories on our alumni and the impact they've had. We'd love to hear from you about where you've worked and how you've used your degree. Please contact Dr. Hill at bj.hill@mindspring.com, or you can send your information to physics@swosu.edu and we'll be sure to forward it to him. Thanks for your help!

In science, "fact" can only mean "confirmed to such a degree that it would be perverse to withhold provisional assent." I suppose that apples might start to rise tomorrow, but the possibility does not merit equal time in physics classrooms. ~Stephen Jay Gould

From now on we live in a world where man has walked on the Moon. It's not a miracle; we just decided to go. ~Tom Hanks (as Jim Lovell , in Apollo 13)

GIVE US A CALL!

We love hearing from you and finding out what you're up to. We're interested in your accomplishments, and we like getting to share them with your friends and classmates. It's also good for our current students to learn what other folks with a degree from SWOSU have achieved. So keep us informed! Stay in touch! We'll keep sending you newsletters and emails to let you know what we're doing, too. Just be sure we know how to contact you. If you change your address (snail or email), let us know. It's easy. You can send us a note by email to physics@swosu.edu,drop a line to us at 100 Campus Dr., Weatherford, OK, give us a call at 580/774-3109, send a FAX to 580/774-3115, or fill out the Alumni Update Form at www.swosu.edu/academics/physics/alumni/alumni-update.asp. You can also connect with us on Facebook or at LinkedIn. (Terry Goforth has accounts on both sites, and we have a SWOSU Engineering and Physics Group established in both places).

WE'RE EASY TO FIND...

You can send mail to us at 100 Campus Drive, Weatherford, OK 73096-3098, send a FAX to (580) 774-3115, or call or e-mail 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*

You can also send your e-mail to *physics@swosu.edu*. We'll see that it gets to the right person.

...AND EASY TO READ!

You can find us at www.swosu.edu/academics/physics. Click on the Alumni link for newsletters past and present, announcements, or to update your information.

ALUMNI EMAIL ADDRESSES

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

If your address is incorrect or if you prefer to use a different address, please let us know and we'll correct it.

If your address isn't on our list (you haven't received any e-mail from us in the last year) and you'd like for us to add it, let us know! We'll gladly include you.

ALUMNI POSTAL ADDRESSES

Did you receive a "hard" copy of this newsletter by traditional mail? If not, there's a good chance we don't have your current address. Let us know where you are and what you're up to these days. We love to stay in touch!

FIGURES FOR *SIMPLE SCIENCE PROJECT*, page 6

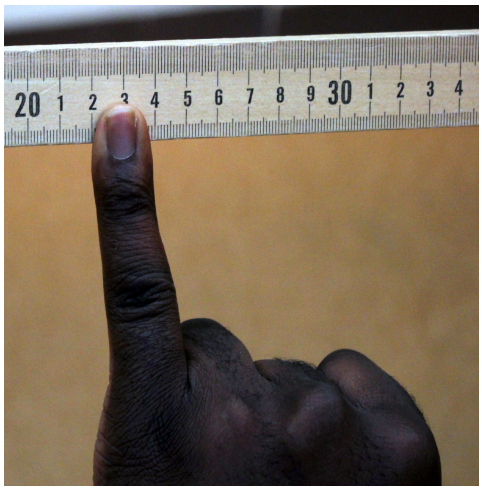


Figure 1: Measure the width of your left pinkie.

Figure 2: Measure the width of your left fist.

Figure 3: Measure the distance from your eye to your pinkie with your arm extended.

Figure 4: Measure the distance from your eye to your fist with your arm extended.

PHYSICS ALUMNI BANQUET 2012

Saturday, March 31, 2012 7:00 p.m. SWOSU Student Union Ballroom $15/person

Name _____ No. Persons Attending _____

Address _____ Phone _____

_____ Email _____

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

We need to provide a head-count to the caterers by March 28, 2012

SHISH KEBAB 2012

Saturday, May 5, 2012 6:00 p.m. Crowder Lake University Park

Name _____ No. Persons Attending _____

Address _____ Phone _____

_____ Email _____

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

If you plan to attend, letting us know will help us in planning the food, but feel free to drop in!

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