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PHYSICS ALUMNI NEWSLETTER

Spring 2015

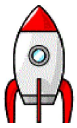
http://swosu.edu/academics/physics ✦ physics@swosu.edu ✦ Terry Goforth, Editor

A Night at the Museum

We hope you can join us on April 25, 2015, at 7 p.m., at the Stafford Air & Space Museum for the 2015 Spring Physics Alumni Banquet. This year's speaker will be **Ron Toelle** ('63), retired engineer for NASA. We will be inducting new members into the SWOSU Chapter of Sigma Pi Sigma and honoring several students for their accomplishments. This year's agenda will include a time to share our memories of **Dr. Benny J. Hill** and to recognize his far-reaching impact on SWOSU, Oklahoma, and beyond.

The museum is located at 3700 E Logan Rd in Weatherford. If you need directions, just ask. Tickets are $20 each, and may be paid for in advance or at the door. We will need an accurate head count by Wednesday, April 22, so if you plan to attend, please let us know how many will be in your party by then. You can contact us by email (physics@swosu.edu), phone (580/774-3109), FAX (580/774-3115), snail main (c/o Terry Goforth, 100 Campus Dr, Weatherford, OK 73096), or just come by in person!

Ron Toelle



Ron Toelle graduated from SWOSU (then SWSC) in 1963. He was hired by NASA in Huntsville, AL, and assigned to the Advanced Studies office to do trajectory analyses on the Saturn Class of launch vehicles. Three years later he moved to the Aero-Astrodynamics Lab where he helped develop trajectory simulation code that is still in use today. His team produced a 4-degree-of freedom (4-DOF) simulation for the Saturn rocket vehicles that was within 0.5% of the 6-DOF computer program but used only 5% of the machine time. The team was responsible for the payload predictions of all Saturn IB and Saturn V launch vehicles. He was then selected as part of a five-man team working directly with famed rocket scientist Dr. Werner Von Braun to develop the Skylab Program.

Ron's simulation programs were later modified to perform the design studies for the space shuttle vehicle (STS), and his team was responsible for all flight design predictions of the Shuttle and publishing the Design Environments.

Ron transferred to the software office responsible for the Solid Rocket Booster electrical test requirements, and eventually to the Solar Heating and Cooling office at Marshall Space Flight Center where he was the resident air conditioning system expert supplying design oversight for solar systems driving air conditioning systems. He helped develop the Solar System trouble shooting team which made 'house-calls' on early systems that did not perform.

After the Solar Program was cancelled in 1981, Ron transferred to Program Development Office where he was study team leader of multiple advanced vehicle studies. Two of his projects that went to program status were Aero Flight Experiment, later cancelled, and Transfer Orbit Stage (TOS) which later flew on the Shuttle and expendable launch vehicles.

From Program Development Ron moved to the IUS/TOS program office as the TOS integration manager for integration into the Shuttle and onto a Titan vehicle. He then transferred to the advanced transportation system office to coordinate with the USAF Program Office in the development of a launch system for President Reagan's Strategic Defense Initiative.

Ron served on a STS pre-flight

work package evaluation team to recommend ways to streamline the pre-launch activities to reduce cost. He was assigned as Chief Engineer for a small project to develop a magnetic levitated experiment to fly on the Shuttle to simulate microgravity. This was accomplished in four months, two weeks and one day. The flight experiment exceeded expectations, and due to the short development time, only consumed 60% of the allotted budget. Ron's final assignment before retiring from NASA was as Chief Engineer of a Solar Powered Propulsion experiment.

Ron consulted for the next ten years specializing in development of collapsible Polyimid structures for space applications. The final hardware he helped design is a ten foot square solar concentrating Solar Reflector to be used in a Solar Power application. This hardware only weighs three pounds.

Ron now spends time working on his antique car collection.

Pi Day

March 14 is Albert Einstein's birthday. Fittingly, it is also "Pi Day" (3.14) The day is even more special this year because Pi Day fall on 3-14-15 (3.1415). Be sure to pause at 9:26 am (or more precisely 9:26:54 am) in honor of Pi (3.141592654). Sure, it's irrational, but what's wrong with a little geeky fun. And to prepare you for your Pi Day celebrations, we've interspersed a few Pi facts and some Pi jokes. (Some are real groaners.) Enjoy!

Using computers, Pi has been calculated to over 1 trillion digits.

Fun at the Lake

The annual Physics Shish-kebab will be on May 2, 2015, at Crowder Lake. We'll be serving food around 6 p.m., but we'd love to have you come out earlier to visit and to take in the many activities available at the lake, including canoeing, fishing, hiking, watching nature, and just taking in some gorgeous western Oklahoma scenery. All the delicious food you remember, plus the induction of new Physics Club officers (with improvised oaths) and the "other awards" that weren't presented at the banquet will bring back memories. No reservations required, but if you let us know you're coming it will help us plan accordingly. We hope to see you there!

Physics and Engineering Club Officers

President: Luke Kraft
Vice-President: Connor Holland
Secretary: Paul Woods
Treasurer: Brian Koehn
Sponsor: Dr. Wayne Trail

Our New Scholars

The 2014 graduating class was a bumper crop for Physics Engineering. Six students completed the requirements for their degrees and joined " the company of scholars." Congratulations to **Ismail Assouroko** (Benin), **Steven Doughty** (Yukon), **Dylan Frizzell** (Mtn View), **Tyler Overton** (Cordell), **Justin Pollmiller** (Littleton, CO), and **Yimfor Yimfor** (Cameroon)!

What do you get when you take the sun and divide its circumference by its diameter?...Pi in the sky.

Kebabs al Fresco

Oklahoma served up a pleasant May evening for the 2014 Shish-kebab at Crowder Lake. Students, faculty, administrators, and family came together for the final Physics Club activity of the academic year in a setting surrounded by the beauty of western Oklahoma. As always, the food was scrumptious, the conversation was stimulating, and the new Physics Club officers and a new sponsor were sworn in with one hand on a copy of Tipler's Physics (of course)! All-in-all, it's

hard to come up with a better way to spend an evening.

Dining in Style

The 2014 Physics Alumni Banquet convened on April 5, 2014, at the Stafford Air and Space Museum (a new venue for us). Attendees were allowed to wander through the museum where they could take in a fantastic array of displays on air and space, including the life of General Thomas P. Stafford and a display featuring the contributions of SWOSU physics graduates to NASA's Mission Control for the Mercury, Gemini, and Apollo programs through the 1960's and 1970's.

After a well-prepared meal catered by SWOSU's Food Services, two new Sigma Pi Sigma members were inducted: **Connor Holland** (So, Duncan) and **Wil Markus** (Sr, Kingfisher). **Paul Woods** (Fr, Weatherford) was recognized as the *Outstanding New Physics Club Member*, and **Connor Holland** was named the *Outstanding Midclassman in Physics*. For the second year in a row, there was a three-way tie for the *J.R. Pratt Award for the Outstanding Student in Physics*. The 2014 honorees were **Dylan Frizzell** (Sr, Mtn View), **Tyler Overton** (Sr, Cordell), and **Luke Kraft** (Jr, Hooker). Physics was once again well-represented in the *Who's Who* Awards. Engineering Physics major **Yimfor Yimfor** (Sr, Camaroon) and Physics minor **Wil Markus** were recipients for 2014. Seniors **Dylan Frizzell** and **Tyler Overton** were awarded medallions to wear during convocation in recognition for *Graduating with Honors*. The awards part of the program culminated with the presentation of several scholarships. These will be detailed below.

2013 was celebrated as a literary year for SWOSU Physics. **Dr. Ray Jones'** book, *Relativity Revealed: A Concrete Approach You Can Understand* was published posthumously thanks to the efforts of **Dr. Stan Robertson** and **Dr. Jill Jones**. This text, intended for the layman, arose out of the seminar series presented by Dr. Jones, and is available for purchase from Amazon. All proceeds from sales of the book go to the Ray C. Jones Scholarship fund at SWOSU. Also completed in 2013 was **Dr. Benny Hill's** book, *A History of the Physics Department* which detailed the growth of the SWOSU Physics Department under Mr. J.R. Pratt and Dr. Benny Hill's leadership and recognizes the accomplishments and contributions of the many graduates from the department during those years.

The evening was topped off by a talk by alumnus **Eric Brown** ('96). Eric is an independent consultant in information and marketing technology and data and predictive analysis. He shared some of his experiences in using social media such as twitter to track and analyze stock market trends and for making investment decisions.

What is the official animal of Pi Day?... the Pi – thon!

A Hand Up

Each spring, we have the opportunity to make a real difference in the educational lives of some of our students in the form of financial support. The scholarships we present are for the next academic year, and help offset the steadily growing expense of pursuing a college degree. At the Spring 2014 Banquet, we were able to provide assistance to five deserving students. The *Arthur McClelland Memorial Scholarship* for $250 was given to Anthony Braden (Fr, Cleveland). The *Chesapeake Scholarship* for $1,000, which is supported by Chesapeake Energy, was presented to Amy Fields (Jr,

Seiling). Connor Holland (So, Duncan) received the $1,000 *Ray C. Jones Scholarship*, and John Paul Woods (Fr, Weatherford) received the inaugural *Benny J. Hill Scholarship* for $1,000. Receiving the *JR Pratt Scholarship* in the amount of $1,500 was Luke Kraft (Jr, Hooker).

The symbol for Pi was first used in 1706 by William Jones, but was not popular until after it was adopted by Swiss mathematician Leonhard Euler in 1737.

Much Needed, Much Appreciated

Earning a degree in Engineering Physics is fun, challenging, and stimulating, but it's no walk in the park. Success requires dedication and long hours of study. Pursuing this degree is a full-time task. But dwindling support from the state has driven the cost of obtaining an education higher and higher each year. This year, the estimated cost of attending SWOSU including tuition, fees, books, room, and board for one year was over $12,000. Add the cost of living over the summer and other necessities like clothing and you see that even working full-time with no vacations at minimum wage, it is impossible to pay for college without incurring debt or receiving financial assistance. Gone are the days when you could work your way through college.

Most, but not all, students receive some support from families, grants, and other scholarships, but let's face it, every little bit helps. Through your generosity, we are able to provide some assistance. Every $1,000 scholarship we hand out translates to an additional 150+ hours of study time for the recipient. That's over five hours per week over the course of the academic year! And that can be the difference in a letter grade in one or more courses.

Your support is vital. Whether $10 or $10,000, your donation will go to a good cause. Scholarship recipients must be majoring in physics and making active progress toward their degree as a full-time student. Academic standing and financial needs are both considered. Some scholarships have additional requirements (such as Oklahoma resident, etc.) You can check out the options and even donate online by going to http://www.swosu.edu/alum-foun/foundation/scholarship/physics.aspx. Remember, all donation are 100% tax-deductible, and don't forget to check with your employer or other organizations about matching grants which can double the impact. If you have any questions about the scholarships or how to give, don't hesitate to contact us at physics@swosu.edu or call Dr. Terry Goforth at 580-774-3109.

In Alaska, where it gets very cold, Pi is only 3.00. As you know, everything shrinks in the cold. They call it "Eskimo Pi."

Changing of the Guard

After ten years as sponsor of the Physics Club, Dr. Tony Stein is passing the mantle of leadership to Dr. Wayne Trail. Dr. Trail took the reins last fall and is quickly learning the importance of snacks (and plenty of them) for a successful meeting. The club continues its impressive list of activities and service, as detailed below.

Larry Shaw created Pi Day in 1989. The holiday was celebrated at the San Francisco Exploratorium, with staff and public marching around one of its circular spaces, then consuming fruit pies. The Exploratorium continues to hold Pi Day celebrations.

Physics Club Activities

by Wayne Trail

I have had a fun (half) year as the new Physics Club faculty sponsor. Taking over for **Dr. Stein** (who had been faculty sponsor for about ten years—thank you Dr. Stein!!) was a lot easier than I thought because Dr. Stein has been helping (I don't think he has missed a meeting) and because the club members make things pretty easy for the sponsor. We had a great get-to-know-you opening barbecue with food, fun, Frisbees, and physics at the start of the semester.

At our first fall meeting we decided to use the club meetings to work through and understand all the demonstrations we use in Physics Day. Physics Day is a day in which we invite physics classes from high schools all over western Oklahoma to come for a day of physics demonstrations and a talk about the advantages of a career in physics and engineering. Some of the demonstrations are: *Shoot the Monkey* (vertical and horizontal components of motion are independent for projectiles), *The Van de Graaff Generator* (high voltage DC), *Sound Baffles* (how sound systems produce low frequency sounds—one of my favorites), *Liquid Nitrogen, The Tesla Coil* (high voltage AC), *The Cloud Chamber* (a way to "view" radioactive decay), *Polarized Light and Strain* (some materials polarize light when they are under stress), *Electromagnetic Induction* (inducing currents with changing magnetic fields) , *Pop the Can* (a heated empty pop-can can be made to collapse when placed in cold water), *Vacuum Chamber, The Angular Momentum Chair, Chladni Figures* (a vibrating plate with a frequency control and some sand) and more. We worked through these one at a time over several meetings discussing the relevant physics and enjoying the sometimes hilarious results.

Over the last calendar year we have carried out several small explorations:

*We studied what happens when a long thin beaded chain in a beaker (or any open container) is pulled out by one end and allowed to fall to the ground. It turns out then chain will pull itself out of the beaker and (here is the weird part) will do so without contacting the lip of the beaker as it leaves.

*We attempted to build pop-can Stirling engines. There are numerous recipes for this on the Web and we did not finish ours, but we intend to return to them.

*We explored flight: By making small adjustments to the shape of the paper or balsa and observing the consequences of those changes to the flight of the plane, you can learn a lot about how the flight surfaces work, and how to make a better-flying airplane.

*We studied boomerangs: We made working boomerangs out of card stock and cardboard and flew them in a classroom. A boomerang works off the principles of lift and conservation of angular momentum. We had a fun day making boomerangs of various shapes, and also throwing some commercial ones outdoors. A few of us have gone "throwing" since then.

*We spent an (extremely cold) evening at the SWOSU Observatory in which we saw a variety of celestial objects including Jupiter, Venus, the Orion Nebula, and the Crab Nebula.

*At our next meeting we will explore air resistance by dropping various sized inflatable balls (small beach-balls) in view of a camera. We will compare our results to Stokes' law

$$F_d = 6\pi\eta rv$$.

We have a great group of students in Physics Club carrying forward the tradition.

Dr. Benny Hill–In Memory

Dr. Benny Joe Hill was born on Feb 20, 1935, on the family farm east of Cordell, to Floyd Hill and Eithel (Weir) Hill and passed away on July 20, 2014, in Sante Fe, NM. When Benny was five, his father bought a farm and moved the family four miles south of Rocky. Not long after, at the tail end of the Great Depression, he took the family to

Tennessee, where Benny's father found carpenter work in Chattanooga. They then moved to Knoxville, where Floyd worked on a huge building in the valley west of town. They later found out he had helped to build Oak Ridge National Laboratory.

In 1944, Benny's family moved back to Cordell to stay. Benny attended Rocky schools, where he participated in baseball, FFA, and was among the outstanding basketball players to come out of Rocky. He graduated from Rocky High School in 1953. Days before graduation, on May 1, 1953, Benny married his high school sweetheart, Jolando (Jo) Gayle (Deeds), in Cordell. For the first year of their marriage, they lived in a small apartment above the Rocky State Bank while Jo finished high school, and Benny commuted to Southwestern State College in Weatherford. They moved to Weatherford the next year and lived on campus until Benny graduated Magna Cum Laude in January of 1957 with a degree in Physics.

Benny soon began working at Los Alamos Scientific Laboratory in New Mexico, where he worked with a theoretical physics group as a Research Assistant. He worked there until 1959. While working at Los Alamos, Benny continued his education through the University of New Mexico, earning an M.S. in Physics. Sons Kevin, Kelly and Kent were all born in New Mexico. Benny returned to Southwestern in 1964 as the chair of the Physics department. Minus some time to complete his PhD at Texas A&M University in 1969, Benny served as the chair until his retirement in 1990. Daughter Kristi was born in Weatherford.

After retiring from teaching, he began working for BDM in Albuquerque, NM. He was there until retiring in 2003. While at BDM, he worked mainly for the U.S. Department of Defense on highly classified and high security projects.

Benny was honored as a SWOSU Distinguished Alumnus in 2006. He wrote and published a book in 2013 about the history of the SWOSU Physics department and the contributions of its graduates, many of whom have played vital roles in government, industry, space programs and defense.

Benny enjoyed traveling, painting, working on family genealogy and spending time with family and friends. Benny is survived by his wife of 61 years, Jo, of Weatherford, sons Kevin Hill and wife Donna of Amarillo, TX, Kelly Hill and wife Tina of Yukon, Kent Hill and wife Kristy of Murphy, TX, daughter Kristi Hill of Weatherford, grandchildren Becca Sullivan and husband Zach; Kylie Hill and fiancé Chad Sanders, Katelyn Hill, Abby Hill and Ben Hill, and one great-granddaughter, Sydnee Sullivan. He was preceded in death by his parents, brothers Danny Hill and Gary Hill and great-grandson Aiden Sullivan. In lieu of flowers, the family asks memorials be made to the **Benny J. Hill Scholarship** fund at SWOSU. Contributions may be made on-line here: https://swosu.site-ym.com/donations/donate.asp?id=3076

What do you get if you divide the circumference of a bowl of ice cream by its diameter?... Pi a'la mode.

It's All Relative

by Stan Robertson

In both 1984 and 2003, Dr. Ray Jones, presented a series of public lectures on the special theory of relativity. Those of you who were so unfortunate as to have missed these excellent and entertaining presentations can now see what you missed. Dr. Jones' book, *Relativity Revealed: A Concrete Approach You Can Understand!* is now available at http://www.amazon.com/dp/1497522110.

Many of you will remember Dr. Jones as a superb teacher and a friend. Few people have ever been as gifted for providing clear and memorable explanations of physical phenomena. His book offers a new chance to experience

a clear explanation of a fascinating subject. All proceeds from the sale of the book will be contributed to the Ray Jones Physics Scholarship fund. In addition, other contributions would be welcome here: https://swosu.site-ym.com/donations/donate.asp?id=10327

SSMA

by Brian Campbell

Last summer, SWOSU hosted the Summer Science and Mathematics Academy (SSMA), a summer academy designed to give 25 high school juniors and seniors a two-week experience in STEM (science, technology, engineering, and mathematics), with rigorous content across the disciplines. This program is designed to motivate students towards pursuing higher education and careers in STEM disciplines.

Participants engaged in DNA sampling, and subsequent analysis through electrophoresis, and received instruction in basic and molecular genetics in the Biological Sciences. Chemistry instruction included introductory qualitative and quantitative analysis, and identification of food dyes and food/drink components. Skills in utilizing instrumentation were developed in the context of investigations (distillation apparatus, gas and column chromatography, UV-VIS, FT-IR Spectrometer, Spec 20+, atomic absorption spectrophotometer, NMR, IR Mass Spectrometer). Physics and Engineering addressed the use of technology to support mathematics and scientific endeavors, while stimulating creativity in participants. Participants built and programmed LEGO robots to complete specific tasks. Mathematics focused on problem-solving techniques with particular emphasis on organization and interpretation of numerical data. Topics included coding theory, problem solving, linear programming, probability, network theory, and geometric proof. One main idea incorporated throughout all mathematics instruction was the use of mathematics in the organization and analysis of experimental data in order to support or refute hypotheses. Through the construction of scale models, Planetary Science investigated activities involving the Earth and its size and place in the Solar System and Geologic Time.

Campers are encouraged to be well-rounded, so extracurricular activities are part of the experience. Swimming, snorkeling, scuba diving, rappelling, volleyball, table tennis, health and fitness training, and weight training demonstrate the influence of a healthy body on an heathy and productive mind. Social engagement and comaraderie are emphasized beginning with a get-acquainted cookout for the participants, parents, faculty and staff on the first day with where games are used to help them learn names, and later at the "Ropes Confidence Course" (both low and high elements) located at Crowder Lake, and with periodic socials with the staff. Daily recreational time also provided opportunities to watch movies or play cards and video games in a social setting. Homework was often an evening social activity which they not only enjoyed, but looked forward to attacking.

The final social event of SSMA was the Participant

Recognition Awards Banquet in which the participants were recognized for their achievements. Parents and siblings were invited to attend this event.

SWOSU will again host the SSMA this June. The SSMA is free (funded by the Oklahoma Regents for Higher Ed). For more information, contact academy director Dr. Brian Campbell.

What do you get when you cut a jack o'lantern by its diameter?... Pumpkin Pi!

Tech Trek

Tech Trek is a week-long math and science camp designed to create interest, excitement, and self-confidence in young women entering the eighth grade. This camp is a partnership between Southwestern Oklahoma State University (SWOSU) and the American Association of University Women (AAUW). The SWOSU chapter of AAUW held its second Tech Trek camp July 13-19, 2014. Dr. Goforth and Weatherford Middle School math teacher Amber Morlan co-taught a core course in math and physics, guiding a dozen aspiring scientists through several experiments with motion, temperature, and solar system astronomy and showed them how to analyze their data using rates, proportions and graphs. Dr. Trail conducted an afternoon robotics sessions for the entire group–some four dozen girls. The campers learned to program Legos robots to do specific assigned tasks in an exciting three-hour session.

Honors College

by Brian Campbell

SWOSU is proud to announce the inauguration of the SWOSU Honors Program. This new initiative will provide students with opportunities to develop their intellectual potential to the fullest using enriching curricular and co-curricular educational experiences. By cultivating academic excellence and forming a community of scholars sensitive to socioeconomic, educational, and environmental challenges, the program builds from and enhances the mission of SWOSU "to provide education, research, scholarly, and creative activities, and service in an intellectually stimulating and nurturing learning environment." Students must have a minimum 28 ACT or 1250 SAT score, and rank in the top 10% of their high school class or have a minimum of a 3.5 GPA to qualify. The Director of the Honors College is Dr. Brian Campbell. More information is available at www.swosu.edu/academics/honors.

The worst thing about getting hit in the face with Pi is that it never ends.

Out of the Darkness

by Stan Robertson

Perhaps you have heard that astronomers now believe that 96% of the stuff of the universe consists of some mysterious "dark energy" and a lot of "non-baryonic dark matter" (not protons, neutrons and electrons). You may have also heard that the expansion of the universe is accelerating and that the "dark energy" is the cause. As for the dark matter, it seems to be needed to provide strong enough gravity to cause galaxies to coalesce quickly enough in the early universe. The current consensus of astrophysicists is that the universe consists of 73% dark energy, 23% non-baryonic dark matter and about 4% ordinary matter, of which less than 1% emits light.

In arriving at these results, astrophysicists resurrected what Einstein considered to be his greatest blunder. Einstein's first attempt to explain the cosmos was based on the assumption that the universe was static, but his equations produced models of the cosmos that would expand or contract instead. To make it remain static, he added a term known as a "cosmological constant". Believing the universe to be static, he missed the chance to predict the expansion that was discovered later. In its pre-

sent incarnation, the cosmological constant represents a constant, uniform energy that fills the universe. Because it remains constant, while the density of matter decreases as the universe expands, it is believed that a time was reached in which the effect of the constant energy became stronger than the gravitational attraction of mass and the universe expansion began to accelerate.

But there are large problems with the cosmological constant idea. First, we have no idea what this "dark energy" might be; second, the fact that the acceleration switched on at a time when the dark energy and dark matter effects were of similar magnitude is known as the "coincidence problem". Even worse than the coincidence problem, the cosmological constant is much, much too small. It is known from quantum electrodynamics that the vacuum of space is a cauldron of virtual quantum particles. According to quantum theory there ought to be an energy density that is about 10^{120} times larger than the one that is currently needed by the astrophysicists. This is the largest known discrepancy between theoretical estimate and observational constraint in all of physics, and it convinces many people that the "cosmological constant problem" is one of the most important unsolved problems today.

Fortunately, there is an easy way out of the cosmological constant problem and that is to drop the cosmological constant and instead modify Einstein's equation by the addition of a term representing gravitational field energy density. Like the cosmological constant, this would be a negative energy density, (otherwise gravity would be self-generating) but variable rather than constant and automatically small due to the weakness of gravitational forces and fields. Einstein had deliberately excluded gravitational field energy for two reasons: first, he could not get the mathematics to work out, and second, he wanted to explain gravity as an effect of spacetime curvature alone. The mathematical problem was worked out in 1971 by Huseyin Yilmaz. Yilmaz' gravitational field energy term accounts for all of the presently known observational data, but requires neither dark energy nor dark matter. If non-baryonic dark matter exists, it might contribute to the density of mass implied by the Yilmaz theory, but finding it would be an empirical matter rather than an exercise of faith in Einstein's self-described blunder. Even better from my point of view, the Yilmaz correction eliminates the occurrence of event horizons. I recently submitted a paper with the details of how it works to an astrophysical journal where it is under review. Some additional detail can be found here: https://www.dropbox.com/s/4hmt2nwt682rgid/Out%20of%20the%20Darkness.pdf?dl=0

On March 12, 2009, the US House of Representatives passed a non-binding resolution recognizing March 14, 2009, as National Pi Day.

Alumni News

This is the part of the newsletter that is written by YOU. We love hearing about your work and activities, and we hope you enjoy hearing about your friends and classmates as well.

Tyler Overton ('14) is employed at Texas Instruments and works in RFAB, a fully automated fab (there are no tool/machine operators), which produces analog devices, mainly LBC7. Each wafer has thousands of devices on it. Tyler is the "owner" of 2-3 processes in the production of 12" semiconductor wafers, which means he takes ultimate responsibility for what happens on these machines. (Usually one process requires between 5 and 10 machines or tools.) He must reduce defects and make the process more efficient, so he deals a lot with automation issues. He doesn't necessarily have to write code, but does manipulate the infrastructure that is already in

place, and makes the processes leaner by using basic experimental techniques along with data collection programs and knowledge of statistics to make decisions.

Lucas Weber ('04) is still in the navy (at his last stop), working in Norfolk, VA, for the Navy Operational Test Agency, COMOPTEVFOR (Commander, Operational Test and Evaluation Force). He's been teaching Design of Experiments, and learning that Operational Testing for the navy has many interesting challenges that lab testing never has to face, such as having testing dates moved up in priority over the needs of the navy. Between that and the multitude of PowerPoint presentations, he's still enjoying his work, but is looking forward to a civilian career where he can put his navy nuclear training to work.

Stephen Russell ('99) has just started a new job at Tinker Air Force Base in OKC.

Come to the nerd side. We have pi.

Dylan Frizzell ('14) is in graduate school at the University of Oklahoma studying physics. He's loving the challenge and the chance to pursue topics of great interest and studying hard to pass all the qualifying exams.

Eric Brown ('95) was recognized by The Enterprisers Project as one of 20 twitter feeds that CIO's should follow and featured in an article "Data should present more questions than answers" at Microsoft for Work. While unconfirmed, we believe that the exposure he got addressing the SWOSU Physics Alumni Banquet last year brought him to the attention of these nationally significant organizations! Way to go, Eric!

Bhaskar Basnet ('07) has a new role at Halliburton. He is know a Technical Sales Advisor, providing technical support on zonal isolation to the Engineers as well as the Sales Group in OKC.

Akira Harguchi from Japan is able to recite the number Pi from memory to 83,431 places and holds the world record.

Jerry Brace ('80) spent half of 2014 traveling in a new motorcoach with his wife, during which he visited a half dozen presidential libraries. He is now working as a consultant in the DC area.

Patrick Heys ('89) is now a Technical Team Leader for Plumchoice, Inc., and has moved from west Texas to the Olympic Peninsula in Washington. We feel your pain, Pat!

Cal Humphrey ('12) is now employed by Sandridge in OKC. He surely had an inside track, since one of his interviewers was none other than our own **Ross Giblet**! Congratulations, Cal! (And good hire, Ross!)

Stephen Duerr ('11) has a new job with Kiwash Electric and a new baby, although we don't think one has anything to do with the other. But, congratulations on both accounts, Stephen!

Darrel Bose ('70) retired from ARCO in 2001, and has retired to the Kitsap Peninsula west of Seattle, WA. We're sure that it's rough putting up with the mild summers and winters!

There once was a girl who loved Pi.
I never could quite fathom why.
To me just a number,
To her it's a wonder,
Its beauty revealed by and by.

LET'S STAY IN TOUCH

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

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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 WE'RE ONLINE!

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.

SCHOLARSHIP FUNDS

If you'd like to donate to one of the physics scholarship funds, just go online to http://www.swosu.edu/alum-foun/foundation/scholarship/physics.aspx and click on *Donate Online*, or send your check (payable to *SWOSU Foundation*) to us (c/o Terry Goforth, SWOSU, 100 Campus Dr, Weatherford, OK 73096) or directly to the SWOSU Foundation (SWOSU, 100 Campus Dr, Weatherford, OK 73096). If you send a check, be sure to designate which fund you are giving to **(JR Pratt, Benny J. Hill, Ray Jones, McClelland, or Physics Unrestricted**) to be sure the money is used for physics. All donations are 100% tax deductible. Check with your employer or organization about matching your donation. And **THANK YOU**!

3.14% of Sailors are Pi rates!

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 attending the 2014 Physics Banquet

Back row: Wendell Riseley, Chris Hladik, Eric Brown, Wade Phares, Scott Taylor
Front row: Joe Sullivan, Benny Hill, Terry Goforth, Tina Crelly Hladik

A mathematician, a physicist, and an engineer are all given identical rubber balls and told to find the volume. They are given anything they want to measure it, and have all the time they need. The mathematician pulls out a measuring tape and records the circumference. He then divides by two times pi to get the radius, cubes that, multiplies by pi again, and then multiplies by four-thirds and thereby calculates the volume.The physicist gets a bucket of water, places 1.00000 gallons of water in the bucket, drops in the ball, and measures the displacement to six significant figures. And the engineer? He writes down the serial number of the ball, and looks it up.

PHYSICS ALUMNI BANQUET 2015

Saturday, April 25, 2015 7:00 p.m. Stafford Air & Space Museum $20/person

Name _____ No. Persons Attending _____

Address _____ Phone _____

_____ Email _____

Please return to: Dr. Wayne Trail ✧ 100 Campus Drive ✧ Weatherford, OK 73096

We need to provide a head-count to the caterers by April 22, 2015

SHISH KEBAB 2015

Saturday, May 2, 2015 6:00 p.m. Crowder Lake University Park

Name _____ No. Persons Attending _____

Address _____ Phone _____

_____ Email _____

Please return to: Dr. Wayne Trail ✧ 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).