

PHYSICS ALUMNI NEWSLETTER

March 2003

Department of Chemistry and Physics * 100 Campus Drive * Weatherford, OK 73096-3089

SUPER SATURDAY!

Mark your calendars. Make your travel plans. You don't want to miss this one! **Saturday, April 12, 2003**, is the date for BANQUET XXII. This year features the Return of the Speaker, and what a show it is going to be. **Jim Bates** ('62) will be sharing information about his current work with NASA. Jim is NASA Project Manager for the Alpha Magnetic Spectrometer (AMS), which he has described as "the best project I have ever worked on since being at NASA." The AMS underwent a very successful test flight on the STS-91 shuttle flight in June 1998. The final version will be deployed to the International Space Station, where it will search for anti-matter, dark matter, and very high energy cosmic rays for up to three years.

Jim also receives the honor of being our first repeat speaker at the alumni banquet. (Some of you may recall he gave a fascinating presentation in 1991 about the Hubble Space Telescope.) In the future, we hope he will be joined by other "second-timers" as well as first-timers, and who knows, third-timers?!?

Don't let this one pass you by! Tickets are \$10 per person. You can't beat this deal. It includes dinner, the awards presentations for Sigma Pi Sigma, Scholarships, and other honors, and is capped by Jim's talk. Make your reservations by e-mail (physics@swosu.edu), phone (580-774-3266 or 774-3124), snail-mail (forms at the back of the newsletter), or in person! We'll see you there!

PHYSICS CLUB OFFICERS

- Pres: Lucas Weber
- VP: Jacob Bass
- Sec: Ross Giblet
- Treas: Casey Wells
- Publ Rel: Matt Webb
- Historian: Bryce Irving
- Spn: Dr. Stan Robertson
- CoSpn: Dr. Tony Stein

To the optimist, the glass is half full. To the pessimist, the glass is half empty. To the engineer, the glass is twice as big as it needs to be.

THANKS INTEL!

The traditional spring tour of the Physics and Engineering Club was nearly derailed by the events of 9-11. The national laboratories of tours past, most other government facilities and several industrial labs were off limits due to security concerns. Fortunately for us, Intel Corp. graciously opened their facilities for perusal by **Casey Wells, Lucas Weber, Jacob Bass, Ross Giblet, Bryce Irving, Susanna Rogers, and Dr. Robertson**. We joined a group of electrical engineering students from UNM and had a grand time. Intel is expanding in several ways, building new

and larger facilities and preparing to enlarge silicon wafer sizes again, but the element size is shrinking again in the sub-micron range. It is sobering to get an overview of a complex manufacturing process and understand the scale of such a huge economic and engineering project. This is just one company in a global competition for a share of a global market and this is the environment that many of our students will enter.

We owe **Dr. Benny Hill** thanks for treating us to a dinner at Chili's and also for some tips about how to prepare a resume and hunt for jobs. We also took his advice and visited the Indian Pueblo Cultural Center on a Saturday morning. While in the area, we toured Old Town and sampled the food, street music and many shops, including the Rattlesnake Museum and the New Mexico Museum of Natural History. As usual, the trip provided raw ingredients for several persons skewered later at the spring shish-ke-bob.

Ross Giblet (Rocky Jr) received a Computer Science, Engineering, and Mathematics Scholarship from NASA in the amount of \$1,250 for the Spring, 2003 semester. The award is based on scholarship and includes a chance to work one-on-one with a mentor (**Dr. Stan Robertson**) and to present the results of that work at the SWOSU Student Research Fair. Congratulations Ross.!

A LOVELY NIGHT

The 21st Annual Physics Spring Banquet was held on April 13, 2002, in the SWOSU Conference Center. Students, faculty, family, and friends were joined by alumnus **Joe Beisel** ('97) and retired faculty member **Dr. Armodian** for an evening of awards and recognition. **Dr. Tony Stein** was introduced as the newest member of the physics faculty. Then getting down to the business of awards, **Lucas Weber** (Weatherford Jr) was inducted as the 160th member of the SWOSU Sigma Pi Sigma chapter. The Physics and Engineering Club selected **Casey Wells** (Ninnekah Jr) as the Outstanding New Club Member, and **Lucas Weber** received the award for the Outstanding Midclassman in Physics. Club president **Susanna Rogers** (Weatherford Sr) was presented the Leadership Award. Following the awards ceremonies, **Jacob Bass** (Kingfisher Sr) reviewed the Physics and Engineering Club's activities for the past year. Good food, good company, and a lovely evening all around!

AND THE ASSIST GOES TO

the alumni contributors, of course. Four students are benefitting this year from the generous donations made by alumni and friends of the physics programs. Scholarships for the 2002-2003 academic year were presented at the 2002 Spring Banquet. **Lucas Weber** (Weatherford Jr) received a \$1,000 J.R. Pratt Scholarship. The Benny J. Hill scholarship in the amount of \$1,000 was given to **Ross Giblet** (Rocky So). **Jacob Bass** (Kingfisher Sr) was awarded \$1,000 for the Arthur McClelland Memorial Scholarship, and **Matthew Webb** (Altus So) was the recipient of a \$500 Physics Alumni Scholarship. The scholarship awards are based on scholarship, need, and involvement in departmental and club activities. As always, they are greatly appreciated by the physics faculty (who see the positive effects of supporting qualified and deserving students) as well as the students who receive the assistance. **THANK YOU FOR YOUR SUPPORT.**

OK, so what's the speed of dark?

MORE ALTERNATIVES TO BLACK HOLES

In a paper published in the February issue of Foundations of Physics Letters, Darryl Leiter (FSTC, Charlottesville, VA) and **Stan Robertson** (SWOSU) showed that a realistic gravitational collapse must be described in a metric that allows outgoing radiation. As a result, the collapsing mass can become smaller at a rate that defeats the formation of an event horizon. Leiter and Robertson found that Einstein's theory of general relativity allows for the existence of these slowly collapsing objects with strong magnetic fields. The collapse to a radius near in size to that of a conventional black hole leaves the escaping radiation so strongly redshifted that the object is actually very faint. Such magnetic, eternally collapsing objects (MECO) of stellar mass would have radiative lifetimes of many billions of years. MECO seem to fit well with the observed spectral and temporal properties observed in stellar mass black hole candidates (BHC). In a paper published in the Jan. 20, 2002 Astrophysical Journal, Robertson and Leiter presented evidence that these BHC are strongly magnetized. Data recently published by other researchers has strengthened the case.

It is possible that a rotating, electrically charged black hole could produce an external magnetic field, however, Robertson has found that the required charge would be immense, even for a hole spinning at a maximum rate. There is no known physical process capable of producing such a charge separation in a collapse process and there would be no way of adding such a huge amount of charge after the formation of the black hole. The electrostatic repulsion would be far greater than the gravitational attraction for a like charge. On the other hand, any matter in the vicinity would be ionized and would contribute a neutralizing charge of opposite sign. Although there are other hypothesized mechanisms for production of magnetic fields by black holes, they require unrealistic rates of accretion, or a stability of external electric charges that cannot be maintained in the face of a realistic accretion rate. The MECO hypothesis appear to be a better alternative for explaining the apparent magnetic behavior of the BHC.

To gain acceptance of the MECO model in the face of overwhelmingly dominant belief in black holes will require both additional theoretical work and more compelling observations. Robertson and Leiter are presently working on the general properties of non-singular metrics and exploring the consequences of spacetimes which are accessible in their entirety to ordinary matter. Non-singular spacetimes may still possess event horizons but transit across one would require a violation of Einstein's principle of equivalence - which requires that life be normal in a frame of reference at rest with respect to any particle of matter. In non-singular spacetimes, a particle must necessarily reach the speed of light to cross the horizon; a feat forbidden to ordinary matter. To enforce the principle of equivalence, the stress-energy tensor of the right member of the Einsteins field equations would have to contain terms that would prevent passage through the horizon. In the case of the MECO model, it is the outgoing radiation that serves this purpose. The outgoing radiation has spectral signatures that should be observable with the current generation of satellite x-ray observatories. Now if we can just talk someone into looking.

GROWING FOR THE FUTURE

Times have been tough for physics programs in Oklahoma and around the country in recent years. This year, SWOSU has the largest freshmen physics/engineering class we've had in a decade. Eleven declared physics, engineering physics, and pre-engineering majors are currently enrolled in General Physics I. We, of course, hope to keep them all until graduation. (What a coup that would be!)

PRETTY AS A PICTURE

The remodeling of the 1st floor east wing of the Chemistry-Physics-Pharmacy building is nearing completion. We probably won't even miss the holes in the floor of room 126 or the cramped conditions in room 124! Hopefully, everything will be ready to go by the fall (summer?) semester. Come by for a tour anytime!

Agent 00LOIQ

I was sitting in my office grading papers, an activity I rate just above being trampled by a stampeding herd of students on their way to the snack bar at the instant I indicate that class is over, when there was a knock at the door. I welcomed the interruption.

"Come in, the door's unlocked."

A man came in. I could tell right away that he wasn't a student. He was clean shaven, and he wore a suit.

"Agent oh-oh-ell-oh-eye-que," he announced while flashing an identity card. "Department of Home Land Security, Eugenics Division. We just call it E.D. in the business."

"Eugenics," I said. "Isn't that about improving the race?"

"Exactly," he replied. "We believe that if we can improve the average American, we can better resist terrorist attacks."

"But how will you do that?" I asked. "How will you improve the average..." And then it hit me. Agent **double oh** low IQ... "You're licensed to kill?"

"Bingo!" he said. "Licensed to kill idiots. Do you know any?"

Well naturally I know several. A certain administrator came immediately to mind, and there was the whole back row of the Physics class who slept, or read newspapers, or passed notes, or studied for other classes. Why did they even bother to come to class, for Pete's sake? In any introductory course there always seem to be students who the only thing they want to get out of the class is themselves. If they ever did graduate, maybe they would go to work for E.D. Yeah, I knew lots of idiots, but killing them...that just seemed too drastic.

"Do you have to kill them? Can't you do something less permanent?"

"Well, we're new at this," he admitted. "I just transferred from another secret agency where killing was considered to be the universal solution to tough problems...not that we actually killed very many, you understand. What did you have in mind?"

"Well, I don't know...couldn't you just send the idiots to Washington? Come to think of it, I guess we already do too much of that. I know! How about sending the idiots to Cuba? Castro did that to us."

"It might work," he said hesitantly. "There is that great Will Rogers quote, 'When the Okies left Oklahoma and moved to California, it raised the I.Q. of both states.'"

"Oh that's cold, that's cruel," I said.

"Well, terrorism is a cold, cruel business," he replied. "I'll have to check with headquarters on this Cuban thing. I'll get back to you."

"Yes, you do that," I said. He left, and I went back to grading papers. Sometimes my mind wanders when I grade papers...

Charles Rogers

HARD TIMES HIT HOME

The slumping national economy has hit Oklahoma revenues and by extension Oklahoma common and higher education. State universities are facing 10-15% reductions in this years budget and have been told to expect additional cuts next year. The cuts are deep, affecting equipment, supplies, travel, operations, and in many cases personnel. Student tuition, which has been increasing at a rate of up to 7% per year may rise as much as 15% for next year if the legislature removes the current caps on tuition increases. SWOSU students are currently paying about \$80/credit hour or about \$2800/year when fees are factored in, so this could potentially jump to over \$90/credit hour (well over \$3000/year) for next fall.

CONNECTING THE "HAVES" WITH THE "NEEDS"

Need to hire someone? Know of an opening in your department or somewhere else? Let us know. We only have one graduate this year (and he's looking at graduate school), but we have some graduates from recent years that are looking to find their first job (out of graduate school) or to change jobs. So if you are aware of positions that need to be filled, tell us, even if it's not for a fresh B.S. We'll pass it on to the folks who are looking (many with experience and/or an M.S. or higher). And if you are looking for a job, ask us. If we know of anything we'll pass the information on to you. After all, SWOSU alum are family, and family helps family!

"Normal people ... believe that if it ain't broke, don't fix it. Engineers believe that if it ain't broke, it doesn't have enough features yet." ----- Scott Adams

Ken Duerksen ('66) works in for Tokyo Electronics Limited (TEL) in Austin, TX. TEL is a \$5 billion/year company, the second largest manufacturer of Semiconductor Process Equipment in the world, and has its USA headquarters in Austin. Ken is working in Process Engineering Development, specifically on Low k Spin on Dielectrics, attempting to shrink the chip design parameters in our never-ending quest for more speed.

Curtis Miller ('99) visited the department during Christmas break. He's a EE graduate student at Univ. Tennessee/Oak Ridge Nat'l lab working on power fuel cells (improving efficiency so we can drive 600 miles on a single charge-up!).

James Bates ('62) is NASA Project Manager for the Alpha Magnetic Spectrometer (AMS), an experiment searching for the existence of anti-matter in the universe. The science team is being led by a Noble laureate, Prof. Samuel C.C. Ting from MIT. The AMS is a very international undertaking with ~200 high energy particle physics from 16 countries participating. For more on this, be sure to attend the banquet!!!

Jacob Weierman (attended '97-'00) is planning to enter graduate school in physics at OSU. Good luck Jacob! We recently learned that Jacob and wife Amy are the proud parents of a new baby girl. Isabella Rose was born January 17, 2003.

Eric Brown ('95) is now Director of Customer Services (WNP-North America) for Marconi Wireless (formerly Metapath Software).

Terry Cox ('86) has a new job as a software engineer with Siemens Transportation Systems. He's currently in Pittsburgh, PA, but anticipates transferring to Minneapolis, MN soon.

Chris Hladik ('95) and **Tina Crelly Hladik** ('94) are now living in Weatherford, TX. Chris is currently working on the F-35 Joint Strike Fighter.

Joanna Blevins ('01) has finished her Masters in Mechanical Engineering at the University of Washington in Seattle. While in graduate school she also worked at the VA Rehabilitation RandD Center creating a finite element model of the human foot, validating automatic meshing software, and dissection and mechanical testing of the soft tissue that covers the bottom of the foot.

Tony Shinault ('97) is working on Product Reliability for non-volatile memories (Flash and Ovonic) and a little Pentium-4 work at Intel.

Richard Vaughn ('99) is working as a financial consultant in OKC and working on an MBA at OU.

Brad Flippin ('88) continues his work for Boeing providing support and assistance to the Brits as they produce their own Apache helicopters in Martock, England. Fortunately his work doesn't interfere with travel, including recent trips to Brussels, Seattle, the Isle of Jersey, Budapest, Portugal, San Francisco, ..., we get the picture.

Bojana (Popic) Zivanovic ('96) received a graduate diploma in Computer Science from Concordia University. She is working as a junior programmer in the IT department of "Blinds to Go," a Montreal-based company.

David Hollar ('74) has been teaching science in public schools for 22 years. He is currently in his 13th year at Coyle Public Schools and is also involved with Quarknet, NASA EPSCoR, and BotBall.

Stephen Russell ('99) is now working for Telos OK in Lawton.

Lee McClune ('69) and wife Harriett still live in Knoxville, Iowa. Lee retired in September, 2000.

In Memory: Andrew D. Weaver (class of '87) died August 12, 2002 of brain cancer. He was most recently employed by Strasbaugh as technical sales rep for semiconductor polishing tools. SWOSU alumni attending the memorial services in Amarillo included Joey and Debbie Pierce, Dennis and Angela Myers, Craig Huffman, and Scott Guthrie. Our sincerest condolences to Andy's brother Tyler Weaver (class of '86).

BEEF- IT'S WHAT'S FOR DINNER

Yes, good Oklahoma beef cubed and speared and cooked up just right with peppers, onions, and mushrooms. Add some rice and a whole lot of other good fixin's and you have the 35th Annual Physics Shish-ke-bab. This year's event (complete with the not-ready-for-prime-time awards) will occur on Saturday, May 3, 2003, at Dr. Robertson's home. The "come-eat" bell sounds about 6 p.m.

WHAT WILL THEY DO NEXT SUMMER?

We're looking for summer internships! Is your employer looking to hire summer interns or other forms of temporary summer employees from the ranks of undergraduates? Send us the information. We'd love to send you some talented, energetic help!

A day without sunshine is like, night.

WE NEED YOU!

With rising tuition costs, scholarships are all the more vital to the health of the program. Many students simply can't stay in school without financial assistance. And the growth of our program means we need to be able to offer more scholarships each year. We can't do this without you. I know that money is tight everywhere these days. You don't need to fund a full scholarship by yourself. There is power in numbers. Just a few dollars-\$5 per month, or maybe a \$20 or \$50 donation each year-will help our funds grow. And don't forget that all donations are tax-deductible. (Double your money-ask if your employer will match your donation.) You can choose to donate to one of our scholarship funds or to the Physics Unrestricted fund. (Money in the unrestricted fund can be used to sponsor recruitment activities, offset travel costs for the Physics and Engineering Club, *etc.*) If you choose to donate, please be sure to specify one of the physics accounts. (Unspecified contributions go into SWOSU's general scholarship fund.) Thank you so much for your support. You are truly investing in the future of an individual, of the physics program, and in a very real sense in the future of this country when you give.

Q: What is the difference between Mechanical Engineers and Civil Engineers?

A: Mechanical Engineers build weapons, Civil Engineers build targets.

KEEPIN' IN TOUCH

We hope you enjoy reading the newsletter just half as much as we enjoy putting it together for you. But to send you one, we have to know where you are. Please keep us up on your current address. It's easy, just mail it (snail or e-), call us, or fax us. We also appreciate information like who you work for, your job title, promotions, or anything else you'd like to share with us. But CAUTION: If you send an update to the SWOSU Alumni Association, we DO NOT automatically receive that information. (Hey, we didn't make the rules!) So, send us a copy, or e-mail us so we know to ask them for the update.

WE'RE WAITING TO HEAR FROM YOU!!!

Drop us a line at 100 Campus Drive, Weatherford, OK 73096-3098, or e-mail or call us at

Dr. Terry Goforth	(580) 774-3109	gofortt@swosu.edu
Dr. Ray Jones	(580) 774-3106	jonesr@swosu.edu
Dr. Stanley Robertson	(580) 774-3124	roberts@swosu.edu
Dr. Charles Rogers	(580) 774-3108	rogersc@swosu.edu
Dr. Tony Stein	(580) 774-3107	steint@swosu.edu
Vera Williamson (Secretary, Department of Chemistry and Physics)	(580) 774-3264	williav@swosu.edu

Don't want to keep track of all that? Just send your e-mail to physics@swosu.edu and we'll see that it gets to the right person(s).

A new and startling revision of the old theories about electricity. John Kuivinen, chairman of an amateur radio group, had discovered what makes integrated circuits (IC) work. Every time smoke was let out of an IC it was found that the system ceased to function. He established in further testing that smoke is what makes all electrical circuits work. Many amateur car restorers have verified his findings. Remember the last time smoke escaped from your voltage regulator? It quit working, didn't it? The simple fact is that the wiring harness carries smoke from one electrical device to another in your car. When it springs a leak, it lets the smoke out of everything at once and nothing works. The starter motor requires large amounts of smoke to work properly, and that is why the wiring to it is so big. Electricity is smoke. In spite of decades of talk and speculation about electrons and such, the fact is that we can find no one who has ever seen an electron. That alone should be sufficient to throw doubt on what was the prevailing theory up to that time.

ALUMNI e-mail 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 alumni e-mail addresses that we have on file.