

PHYSICS AT SOUTHERN

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Published once in awhile

February 28, 1999 For students, past & present, and friends of the Department

(SAU logo here)

(Physics Dept

logo here)
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HOT NEWS

1. ELEMENT 114 !

Element 114, representing the beachhead of what might be an "island of stability" among heavy nuclei, has been successfully created, according to scientists at Russia's Joint Institute for Nuclear Research in Dubna. Artificially made elements heavier than uranium are generally unstable, but theorists have for some time thought that elements in the vicinity of number 114 and above might well possess a configuration of neutrons and protons that makes for longer life. The Dubna result seems to be evidence for this. Made by shooting atoms of calcium-48 into a target of plutonium-244, atoms of element 114 (with a nuclear weight of 289) were detected through their decay into element 112. The lifetimes for elements 114 and 112 are 30 seconds and 280 msec, respectively. Element 113 has not yet been discovered. (News items in Science, 22 January 1999. Published by the APS.)

ALUMNI NEWS

2. JOHN LAUER (1970)

>My work as VP for Research and Development at Per-Se Technologies (nee Health Data Sciences) keeps me busy both at the office in
>California as well as numerous other locals. About nine months ago,
>we signed an agreement with Sumitomo Electric Industries to
>distribute and install our health care information system throughout
>Japan.
>
>Deanie is running an interior design business from home. She enjoys
>the design and creative aspects very much ... She specializes in
>historic design, which is an important aspect in our community here
>in Redlands.

3. RICK HOWARD (fr. through jr. years, 1975-1978)

>Dreama and I moved to San Jose this summer. I'm working for VLSI
>Technologies, Inc in their Consumer Digital Entertainment division.
>We do chips for TV settop boxes. MPEG stuff.
>
>Dreama's working for the VP of University Relations at Santa Clara
>University. Identical work to what she was doing at Gonzaga
>University when we were in Spokane, WA.
>
>I finished my MSEE at Gonzaga this summer ... we're loving the
>weather here in San Jose and are slowly becoming adjusted to the
>traffic.

4. JOE MASHBURN (1976)

>I am on sabbatical this semester. I am work on some research in
>topology with some friends at Miami University in Oxford, Ohio.
>I don't have to leave home for that. There is also a topologist
>visiting from Auburn, so it is a very interesting, and I hope
>fruitful, semester.

5. DELYNNE DURHAM (1972, married to Dr. Mike Lilly)

Delyne and her family spent a year in Australia on Mike's sabbatical and now have moved to Redlands, California. Mike has been appointed Head of Molecular Biology and Gene Therapy at LLU Medical Center.

6. JULIE GILKESON (1997)

>Medical school is still the freight train that it always is, and I
>like it that way (it keeps me out of trouble). Thanks for your
>prayers and support.

7. DAVE WHEELER (1974)

>Things are going well with me. I thoroughly enjoy the independence
>and flexibility of having my own [law] practice.

8. CHRIS HANSEN (1989, faculty member, Physics Department at Southern)

Chris has been asked to by the Radioactive Ion Beam group at Oak Ridge National Laboratory to assist in the reconstruction and calibration of some apparatus needed for the experiments. Chris and Gaylene expect soon to be parents.

9. CHRIS CARLSON (1994)

>Heather is continuing to enjoy her job as a hospice social worker.
>The company she works for is just now about a year old and is having
>growing pains like having too much work for the number of employees.
>This problem is better than the opposite one. So Heather has been
>very busy but she finds the work very rewarding.

>

>We just had our 5th wedding anniversary this past May. We took a
>week off in California: Santa Cruz, Monterrey, Carmel, and San
>Francisco.

>

>My research is making progress. I have a paper being published in
>August. It's the first one that I am 1st author on. It will be in a
>superconductivity journal called Physica C.

10. SAU PHYSICS GRADUATE EARNS PhD IN PARTICLE PHYSICS

Rick Cavanaugh, 1993 Physics graduate who stayed for the 1993-1994 to strengthen his skills by retaking (actually, team teaching) Advanced Quantum Mechanics, completed work on his PhD on February 12. His is the 15th Physics Phd earned by graduates of the Physics Department and the 22nd PhD if doctorates in Geophysics, Oceanography, Chemistry, Mathematics, Computer Science, and the History of Science are included.

11. JUSTIN WOODY (1996)

Jennifer and I bought a house, and I am working for a Microsoft Partner Company. Dealing with large companies' and schools' networks keeps the challenges going.

12. SC MATHEMATICS/PHYSICS GRADUATE LANDS JOB AT THE COLLEGE OF WILLIAM AND MARY

Shandelle Henson entered SC as a Physics (and Math?) major in the fall of 1983, changed her emphasis to Math, and was graduated in 1987. She completed her PhD in Mathematical Ecology at UTK and has worked very successfully in that field at the University of Arizona. Now Shandelle has accepted a job offer from the Mathematics Department of the College of William and Mary. Among other things, 10K startup for computers, 2-and-2 teaching load (2-and-1 my first year), great research dept, ivy league, great students, beautiful campus, all buildings brick, extremely collegial Department. "A cross between Southern and University of Arizona [the] best of both. Appalachians 2.5 hours away. ... Open ocean 2 hours away (it's on Chesapeake Bay) more or less. Coastal barrier islands, etc."

13. JAMES NELSON (Physics minor, left for computer job 1997)

>My job is fun, and it's a very relaxed atmosphere. I work
>in Engineering Computer Services at Cisco [near San Francisco],
>as the PC Admin for OIBU (Optical Internetworking Business
>Unit---they design the high-end routers, like the 12000 GSR
>[see <http://www.cisco.com/warp/public/733/12000/>]). My job
>consists of developing and maintaining OIBU's NT servers and
>resolving any escalated issues from the users, plus involvement
>in more global projects like preparing for NT 5.0, etc.

14. JAMES DAVIS (1997)

We are having a great year here at Sunnydale.* Our program keeps getting better and it looks as if all the staff, that currently work here, intend to return the next year. That should provide some stability for the academy.

I was able to get that new physics text that I had talked with you about in the past. I am pretty happy with it. Some of the projects that students turned in to me earlier this year include writing a track and field manual from a physics perspective and designing a proposal for a sport that can be played by colonists on a moon colony.

They hired a PE teacher here who wanted to teach some math classes as well. This has helped lighten my load. It also allowed me to teach some other classes that they wanted me to teach. Last semester I taught a class called Web Publishing. In this class I taught the students how to write HTML and things to consider in web site development. This semester I am teaching a class called Internet 101. In addition, I teach Algebra II, one section of Geometry (we have three sections), Advanced Math (Pre-Calc), and of course physics. I am considering making Pre-Calc a semester class and offering an AP Calculus course the second semester.

In other news, we are expecting to add James C. Davis, III to our family around April the 1st, 1999. I have a picture from the ultrasound that I stuck on the web. It can be found at

www.computerland.net/~jcdavis/index.html.

*Sunnydale Adventist Academy

15. KEN CAVINESS (1982, chair, Physics Department at Southern)

Collaborates with Collegedale Academy faculty member on a French language Sabbath School that meets every month.

16. JONATHAN VIGH (left 1997, after soph. year, to serve as S.M.)

[After one year as a teacher on Chuk] I've been here at Pennsylvania State this year soaking up knowledge like a sponge, or something like that. It's been a very busy semester since I'm taking 15 hours of all 400 level meteorology courses: Atmospheric Physics II (cloud physics, atmospheric chemistry, and precipitation processes), Statistical Methods in the Atmospheric Sciences (involves statistics and writing C++ programs to analyze data -- very time consuming), Atmospheric Dynamics (the kinematics of the atmosphere, momentum equations, Coriolis force, potential vorticity, etc.), Synoptic Meteorology (large scale storms and forecasting -- many equations), and finally, a Atmospheric Physics Lab reminiscent of Physics lab at SAU. Today, in fact, we did a lab on error propagation. It brought back old memories of that first lab my Freshman year with Dr. Bignall -- Error Propagation. I don't think any of the students understood what was going on that first day -- we were bewildered by all the funny looking Greek symbols! All in all, I can say that I've been well prepared by my teachers at SAU. By the grace of God, I've had the top scores in several of my classes, and this semester is starting out very good.

NEWS ABOUT PHYSICS STUDENTS

17. JEREMIAH WEEKS (Physics major serving as S.M. in Germany)

My job here in the town of Calw consists of planning activities and get-togethers for the youth, giving Bible studies, helping with local missionary work in surrounding towns, and building up the new Pathfinder program. I'm a one-shot student missionary, so a big part of my job is to inspire church members to carry on after I leave. God is working with us, though, and things are looking bright.

The language has been coming along, and I'm finally understanding most all of what I hear. I haven't really had a choice whether to learn it or not, since all of my work is in German. Last Sabbath I gave my first children's story in German. That was a thrill. The big goal is a sermon in June. God's going to have to really help me through that one. Oddly enough, the family I live with comes from South America, so they speak Spanish at home. Thus, I'm also having to learn Spanish while in Germany.

Germany is a funny place, as you well know. The food is especially interesting. If you drop a loaf of German bread on your toe, it's going to hurt for a week. Germans like to eat breakfast in the morning, and then repeat it in the evening with a different name and lots of beer. It's also a new experience finding peanut-butter on the foreign-foods aisle of your local supermarket. Lucky for me, I've had the good fortune of getting to know the family of an American soldier stationed in Stuttgart. Every now and then they surprise me with a six-pack of root

beer. But what a job it is explaining to the church youth that root beer isn't really beer!

"Why do you like to drink American beer?"

"Actually, this is called root beer, but it isn't real beer. It's more like Coke."

"Then why is it called beer, if it isn't?"

"Well you see, guys, that's just the American way."

Please pray for us over here in the land of coo-coo clocks. God's doing some exciting things all over the world, and Germany is no exception.

Aufwiedersehen

-- Jeremeister von Weeksenhof

18. GRADUATING THIS YEAR

Michael Brandt (Seeking work or advanced study specifically in the area of experimental techniques)

Saffron LeBlanc (Graduate school)

Myla Thomas (Teaching)

DEPARTMENTAL NEWS

19. SEMINAR SERIES

The series is going quite well. There have been a couple of shifts in the schedule, but attendance is good (15 to 25).

20. WSMC SPOTS

The Physics Department, thanks to a donor gift, sponsors short "mentions" on WSMC three times a day. Here are some samples:

a. WSMC ... this program was partially supported by the Physics Department of Southern Adventist University, which offers a minor, a 30-hour BA, and a 40-hour BS degree in physics. For additional information, consult the Web site at www.physics.southern.edu.

b. WSMC ... this program was partially supported by the Physics Department of Southern Adventist University, which pioneered the use of electronic communications long before there was an internet. For additional information, consult the Web site at www.physics.southern.edu.

c. WSMC ... this program was partially supported by the Physics Department of Southern Adventist University, which offers general education courses to students of all majors. These courses include Earth Science, Astronomy, Introduction to Physics and Issues in Physical Science and Religion. For additional information ...

d. WSMC ... this program was partially supported by the Physics Department ... one of whose alumni is now at "Silicon Valley," doing the visual imaging computer work for the Human Genome project. For additional information ...

- e. WSMC ... this program was partially supported by the ... which has graduated 79 physics majors, who have between them gone on to earn 57 advanced degrees. For additional information ...
- f. WSMC ... this program was partially supported by ... one of whose alumna was a program manager for Space Station Freedom. For ...
- g. WSMC ... this program was partially supported by ... one of whose alumni studies ocean currents for the U.S. Navy using side-view radar from satellites. ...
- h. WSMC ... this program was partially supported by ... whose graduates continue learning after commencement. 67% of them have gone on to earn one or more advanced degrees.
- i. WSMC ... this program was partially supported by ... one of whose alumni was voted "young scientist of the year" in the Great Lakes area.
- j. WSMC ... this program was partially supported by ... two of whose alumni have made significant contributions to the theory of general relativity.
- k. WSMC ... this program was partially supported by ... offering research experience for undergraduate physical science students. This research is frequently published in international journals.
- l. WSMC ... this program was partially supported by ... offering not only classes and laboratory experience but also undergraduate research, extensive amounts of information on the Web and in displays, and biweekly seminars featuring the work of students and of professional scientists.
- m. WSMC ... this program was partially supported by ... whose students have gone on to Colorado State University, Florida State, Lowell, MIT, Stanford, Vanderbilt; and to the universities of California, Chicago, Colorado, Indiana, Washington; and others.
- n. WSMC ... one of whose students served as the head of the Department of Radiology at Loma Linda University, then as head of Radiology at San Bernardino County Hospital, and is now the director of San Bernardino County Hospital.
- o. WSMC ... whose graduates are on the faculties of Andrews University, Montemorelos University, Pacific Union College, Southwestern Adventist University, Walla Walla College, and Southern Adventist University.
- p. WSMC ... one of whose graduates is a geophysicist who prospects for oil with a major Midwest oil firm.
- q. WSMC ... eleven of whose former students are now serving as dentists, physicians, radiologists, anesthesiologists, and biomedical researchers.
- r. WSMC ... whose students have taught secondary-school science in Tennessee, Georgia, North Carolina, Missouri, Virginia, Washington State, California, Hawaii, Bermuda, and Iceland.

MISCELLANEOUS

21. STILL ANOTHER AREA CODE CHANGE LOOMS AHEAD FOR SAU

Changing our area code (again) is inevitable. The best we can hope for is that Knoxville will get 423 and we'll get a new area code. In my opinion the FCC's decision to allow six competitors in each market for PCS digital cellular was the straw that broke this particular camel's back. We just don't have enough numbers in 423 any more (615, our previous area code, has already split again). Competition is wonderful when I get my phone bills, but it is the root cause of this whole area code hassle.

We'd better hope that the decision here goes for a change in area code. The alternative (called an "overlay" - the Chicago solution) is worse: having to dial ten digits for every call, or yet worse yet having to dial ten digits for some calls! The problem for Doris & Co. is that at this point we don't know which way it'll go.

[information provided by John Becket, telephone systems manager, SAU]

22. RAILROAD TRACK GAUGE

From: Henry Kuhlman <hk>
Date: Mon, 8 Feb 1999 10:15:01 -0500 (EST)

The US Standard railroad gauge (distance between the rails) is 4 feet, 8.5 inches. That's an exceedingly odd number. Why was that gauge used?

Because that's the way they built them in England, and the US railroads were built by English expatriates.

Why did the English people build them like that? Because the first rail lines were built by the same people who built the pre-railroad tramways, and that's the gauge they used.

Why did they use that gauge then? Because the people who built the tramways used the same jigs and tools that they used for building wagons, which used that wheel spacing.

Okay! Why did the wagons use that odd wheel spacing? Well, if they tried to use any other spacing the wagons would break on some of the old, long-distance roads, because that's the spacing of the old wheel ruts.

So who built these old rutted roads? The first long-distance roads in Europe were built by Imperial Rome for the benefit of their legions. The roads have been used ever since.

And the ruts? The initial ruts, which everyone else had to match for fear of destroying their wagons, were firstmade by Roman war chariots.

Since the chariots were made for or by Imperial Rome, They were all alike in the matter of wheel spacing. They were spaced to match the tracks that a team of horses made.

Thus, we have the answer to the original questions. The United States standard railroad gauge of 4 feet, 8.5 inches derives from the original specification (Military Spec) for an Imperial Roman army war chariot. MilSpecs and bureaucracies live forever.

23. THE Y2K PROBLEM (second item)

From: rsegna@interserv.com <rsegna@interserv.com>
Subject: Y to K problem

>Taken from a memo received at a Fortune 500 company;
>
>To: VP, Corporate Administration
>
>I hope I haven't misunderstood your instructions, because this Y to K
>problem makes no sense to me.
>
>Be that as it may, I have completed the conversion of the corporate
>calendar for the year 2000, per my understanding of the instructions.
>
>The months now read as follows:
>
>Januark
>Februark
>March
>April
>Mak
>June
>Julk
>August
>September
>October
>December
>
>Please let me know if there is anything else that needs to be done in
>preparation for the year 2000.

PUBLICATION FROM PHYSICS AT SOUTHERN

24. FIELD THEORY FOR CHEMICAL SPACES

This is the first article resulting from Dr. Hefferlin's work on the curvatures (actually, second differences) in data as arranged in periodic systems of atoms and molecules. The idea came after the presentation of what was suspected to be, and what turned out to be, a not-too-hot topic at the DIMACS conference at Rutgers University a year ago. When an invitation was given to submit the text of the talk (or something equivalent), this idea suddenly came to mind. Dr. Hansen, on our staff, gets credit for having pointed out how the numerical solution to the Laplace equation is equivalent to iterative averaging inside a boundary.

The submitted text is still in press. In the meantime, a conference on Trends in Mathematical Physics occurred in Knoxville. Dr. Hefferlin went, and again there was an invitation to submit a refereed paper. This paper is also in press, but preprints have been permitted and can be found attached (if you can read postscript files) or at

<http://ares.math.utk.edu/maphya/After/Proceedings/hefferlin/hefferlin.ps.gz>

[Titles and abstracts of all physics research papers published by SAU staff are available on the Web page given below.]

25. EDITORIAL COMMENTS

- i. The number of former physics students (almuni) to whom we can send these electronic issues of Physics at Southern (saving from 33 cents to a dollar a pop) increased rapidly for a couple of years. Now it is about constant, in spite of the continued growth in the use of the Internet, because of e-mail address changes. If you notice that an alumnus or alumna hasn't been mentioned recently, it's almost a sure thing that we haven't heard from him or her. If you know that person's e-mail address, please share it with us (unless, of course, you know that said person wishes not to be contacted).
- ii. Please continue to be on the lookout for prospective physics students. You can be our best recruiters, our best advertisers. And note that the number of places where a young person who happens to want to study our sublime science in the ambiance of an Adventist university or college is dwindling. Why not put in a good word for SAU?
- iii. The baby boom continues (cf. items 8 and 14)!
- iv. Dr. Hefferlin is solely responsible for the contents of this issue.