The Photon: Spotlight

On Alumnus Jeff Jewett

Alumnus Jeff Jewett is currently a systems analyst with the University's Office of Information Technology (OIT), where he worked for years doing all sorts of cool computer stuff (development and administration). So how (and why) is he a 2000 physics B.S. graduate? Read on!

by Jeff Jewett, Class of 2000

Jeff and the Jewett family. (l-r: Eric, Greg, Lee-Ann and Jeff)

Although blessed with a family and a comfortable job, at the age of 46, I decided to get an undergraduate degree in Physics. Reasonable people questioned the wisdom of this act, and when it was over (and to my surprise), I was asked to write a bit about why I had done it, and what it was like.

Let's start at the beginning. I was born on Easter Sunday, 1950, in the French Quarter of New Orleans, Louisiana. My father was a naval officer, so we traveled a bit; I attended 9 different schools from 1st grade to 12th, ending up in Virginia Beach, Virginia, where I was high school valedictorian, and like all valedictorians, received a year's free subscription to *Reader's Digest*.

I almost went to Cal Tech, but the person they sent to interview me got on the wrong plane and ended up in Pittsburgh (!) and we talked over a scratchy phone line in a mutually unsatisfying fashion, he in the airport and I in the principal's office, and I missed the cut. Looking back, I wonder if it was all a test. I mean, he *said* he was in Pittsburgh.

So I chose the University of Maryland since I was technically a resident (my mother's family lived in Denton), and Maryland offered me both a good physics program and a General Honors scholarship. I had enjoyed physics in high school, and thought it might be fun to continue, in lieu of having any sort of authentic plan. Strange how things unfold.

The Honors Dorm at that time was in Cambridge A, which was across the street from what is now OIT (and what was then the Computer Science Center), and I roomed with Brian Reid (later to be a Computer Scientist of

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On Particle Astrophysics

Mining for Neutrinos

by Gregory Sullivan
Assistant Professor, UM Physics

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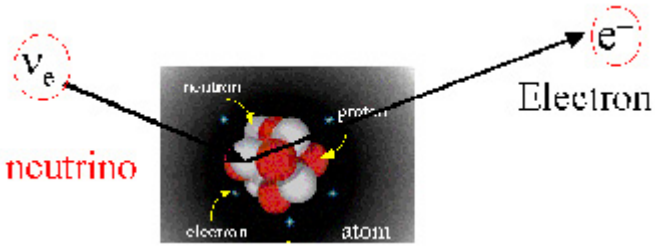

What are Neutrinos?

Neutrinos are one of the fundamental particles that make up the universe. They are also one of the least understood. Neutrinos are similar to the more familiar electron, with one crucial difference: neutrinos do not carry electric charge. Because neutrinos are electrically neutral, they are not affected by the electromagnetic forces which act on electrons. Neutrinos are affected only by a "weak" sub-atomic force of much shorter range than electromagnetism, and are therefore able to pass through great distances in matter without being affected by it. In fact, the average neutrino will go through about a light-year of steel before it hits something. This makes neutrinos very hard to measure.

Where did all the neutrinos come from?

Soon after the big bang, when the universe was at a very high temperature, many neutrinos were produced. In addition, when a star explodes as a supernova, many neutrinos are emitted. Neutrinos are also copiously produced in nuclear reactions in the core of the sun, and from cosmic rays that come into the earth's atmosphere and interact with oxygen or nitrogen nuclei. By studying these neutrinos with great precision we hope to learn more about the fundamental forces of nature and something about how particles get mass to begin with.

Catching Neutrinos

It takes a special kind of detector to measure neutrinos since neutrinos themselves cannot be directly detected. What are detected are the by-products of their interactions. On the rare occasion that a neutrino hits a nucleus, or an electron, an electron will get knocked out with sufficient energy (or speed) to be detected. So then, to detect neutrinos a detector has to have a lot of target nuclei to increase the chance of a neutrino hitting something, and it must be able to detect the charged particle byproducts that come out after such an interaction.

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some renown), with whom I shared my *Reader's Digests*. Given this environment, it was perhaps inevitable that I would succumb to the siren song of computers, which were quite wonderful toys, or at least major distractions.

The University eventually grew weary of my never going to class, and the Computer Science Center grew weary of my hacking into their systems. The University kicked me out, and the Center offered me a job. After a lifetime of gypsy existence, I was ready to stay put, and it was a grand deal; I worked on compilers, graphics packages, and had endless fun.

Time passed. I got married, had two kids, visited Stonehenge, nearly died while hang gliding, and gradually came to appreciate that the job had lost a certain element of intellectual challenge. The Computer Center (like most University IT centers, it should be noted) had shifted focus away from development, and towards administration. My job had changed in a similar fashion, from test pilot to airline pilot, and I was reminded of what Tolstoy said: Boredom is the desire for desires.

Then, in the early 1990's, my younger brother stopped chasing tornadoes long enough to get a PhD in Meteorology at Urbana-Champaign. How galling! So, in 1996, I walked into the Physics department and promised to be really, really good if they would take me back.

"Much has changed," they said, cheerfully, and informed me that I would need to repeat the *entire* sequence (my original classes in phlogiston and the luminiferous ether having little value). Ok. Maybe I wouldn't have to learn about Regge Poles.

OIT graciously allowed me the work-schedule flexibility needed to pursue this adventure, although I was still working fulltime (40+ hours a week) as a Systems Analyst for them. This was surprisingly hard. I had expected to be able to maintain a reasonably consistent level of effort, but found myself violently sloshing between the twin attractors of workload and classload. The Senior year was the worst, as my father was quite ill, but finally it was over, and I was at Commencement in my funny costume and my silly hat, with my family loudly whooping in the audience, and I had graduated in Physics with straight A's.

The piece of all this of which I am proudest - and this was not predicted - was simply that I didn't lose contact with my family. I had help, to be sure. No matter how deep into Quantum Mechanics, a useful perspective is restored when a small person enters the study room and asks "Which would you rather do? Homework, or spend time with your children?" Shameless manipulation is not always unpleasant!

So, certainly the bulk of my success was due to the enormous and good-natured sacrifice of my family, and to the hard work of a caring and immensely talented faculty.

But, why did I choose Physics? Alert friends and co-workers have charitably

pointed out that certainly there are easier majors. Say, Computer Science. And there certainly are more lucrative professions. Say, Computer Science. Part of it, to be sure, was a matter of getting back on the horse - a desire to complete that which had been started. And there was the satisfaction of doing something hard, and doing it reasonably well, and really stretching your brain.

And, beyond that is this idea that Physics is an inquiry into the deepest principles, down at the bare metal so to speak, as we say in computers. I am reminded of an interview I saw with the Director of FermiLab, who said that one of the salient characteristics of physicists is that they ask the questions that young children ask, e.g. why is mud slippery but wet sand isn't? He said that most children have that sort of curiosity eventually burned out of them, but the physicists somehow escape. But mostly, and this is difficult for people to understand, physics is fun.

And, the future? In the near term, I think that studying for the GRE's would provide an excellent opportunity to review what I've learned, and after that, we'll see. It's never too late to have a happy childhood.

Finally, I am reminded of the story that John McCain tells of how, after becoming a Senator, he returned to Vietnam, and while visiting the prison where he had been incarcerated, learned that the villa once used by Ho Chi Minh (under whose regime he was imprisoned) is nearby. He asks if he can see it, and ends up spending the night in Ho Chi Minh's bed. "If you wait long enough," he said later, "anything can happen."

• See Jeff's profile

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