

Meet Physics Department Alumnus

Sean Washburn, Ph.D.

Stetson class of 1976

OPEN LETTER TO PHYSICS MAJORS:

Dear Stetson physics folks-

Since I graduated from Stetson in 1976, I've been very lucky. First, in grad school at Duke, I worked on crystals of solid hydrogen where the molecules reorient under forces that are analogous to random spins. In spite of careless interpretation of previous experiments, we were able to confirm that the freezing of the molecules' orientations into a glass was a gradual process. In the mean time, I learned the basics of doing experiments at low temperature (at less than 1K). Then I worked at the IBM Research Division as a postdoc in a group studying electronic transport in systems where the wave functions created weird interference patterns because of random scattering from impurities and later (in cleaner semiconductor systems) chaotic scattering from the walls of the devices. I was there when IBM scientists won two Nobel prizes in a row, which made it an exciting place to be in. Not to mention that the science our group was doing was getting quite a bit of attention. The random scattering of electrons has been a real gold mine for me and I am still working on very similar topics now after 18 years - except that now I am working as a faculty member at the University of North Carolina at Chapel Hill. In addition to electronic motion, I now work on a big variety of projects that keep me learning at a very fast pace -- which is the best life: sometimes overwhelming, but never boring. We manipulate big molecules (carbon fullerene nanotubes) and study the friction from dragging them and the electrical effects from moving them. For example you can roll them over graphite using the carbon atoms as gear teeth. With the computer scientists, we study the best ways to make scientific instruments "talk" to humans through virtual reality computer interfaces. With sociologists, we study how scientists communicate with each other. And so on. And of course I teach courses, organize both courses and faculty in both physics and applied sciences. In fact, the work in applied topics is the most entertaining now, because I get to

work with really new stuff. For example with orthopedists, we're trying to device better ways to grow cells for artificial tendons and cartilage.

If you want advice: Continue to learn new ways to do science and new ways to apply what you've learned. And as with card games: rule one is stay in the game (don't give up) and rule two is stay lucky (open the door when opportunity knocks). These are both simple platitudes, but they are the only advice that I feel comfortable giving. OK, OK. One more bit of advice: Make sure that you see Tori Amos if she gives a concert anywhere nearby. And read Ted Hughes's poetry, especially "Crow". And so on.

Don't worry too much if you don't know exactly what you want to do yet. I liked physics at Stetson, but I began to think of it as a way to spend my life only after a few years at Duke when I figured out just how the hydrogen molecules were aligning with each other. There had been a model for the alignment that totally disagreed with the experiments we'd done. All I did was notice an analogy to the alignment physics for a different system and plugged this new detail into the model and everything agreed perfectly. There was nothing clever about it, all I'd done was apply what I knew to something a little different. But at that moment, I was one of two people on the whole planet who understood this particular physics. I had to explain it to my advisor (a professor who'd been doing physics for 40 years) and to his buddies. Obviously I was very proud of myself, but that wore off in a few days. The addiction to understanding new stuff never has. If I stay lucky, it never will.

--Sean Washburn

Gandhi (about Western Civilization): I think it would be a good idea.

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DR. WASHBURN'S WORK is best represented on his own web site. Below are a couple of images from the site - but for the best representation of his work take a tour through his site at The University of North Carolina at Chapel Hill. He suggests the following links:

<http://www.physics.unc.edu/~sean>

<http://www.physics.unc.edu/~zhou/muri/research.html>

There are some mpeg movies at:

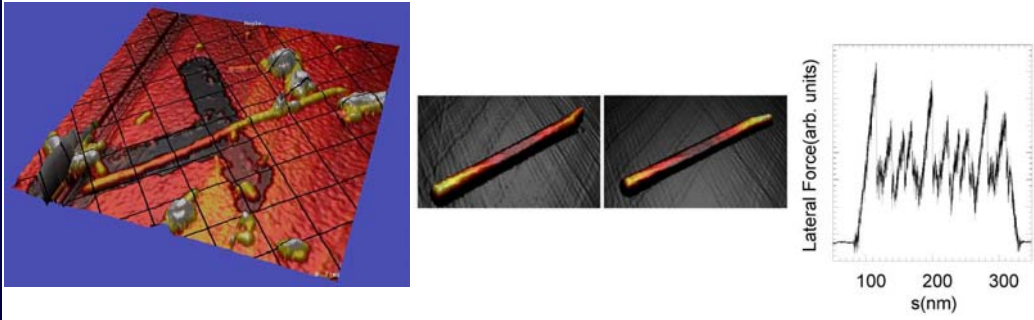
<http://www.cs.unc.edu/Research/nano/doc/movies.html>

and still images at:

http://www.cs.unc.edu/Research/nano/hotshots/nWB_sys.tif (these are big!)

<http://www.cs.unc.edu/Research/nano/hotshots/buckypersp1.tif>

<http://www.cs.unc.edu/Research/nano/hotshots/nanoBridge.tif>



Dr. Washburn has given us permission to publish his address information, and he would welcome contact from Stetson Physics majors (past, present, or future) or from anyone else.

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