



The Dilated Times

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Editors: Helen Geib and Heather Hughes

AN EXCELLENT FIRST TEACHING POSITION FOR DR. F.

Ln late 1967 I received a phone call from Professor John Ollom at Drew. I was beginning my 5th year of graduate school at Penn State, had no completion date in sight, and had not given much thought yet to a job. Dr. Ollom told me of the decision to add a faculty member in the Drew physics department (going from 1 to 2), and asked if I were interested in applying. It took a second call from him a month or so later to convince me he was really serious. And so, having had a wonderful experience myself as a student at Drew, I decided that this would indeed be an excellent first teaching position for me, IF I could get the job, and IF I could complete my thesis by September of 1968. I came for an interview in March and was offered the job shortly after. Returning to Penn State, I plunged into a full-time effort to take my remaining data, and write it up over the summer. My move to NJ in early September literally occurred on the day after I had defended and turned in the final copy of my dissertation.

I came back to a Drew that had expanded from about 800 to 1600 students during the late 60's, and the period was heavily influenced by the Vietnam War. My arrival marked the first year of occupation for the Hall of Science and everything was spanking new (with lots of empty space!). We were happy to gradu-

ate 1 or 2 majors per year, and the physics comprehensive exam still scared seniors for most of their spring semester. Many of our majors went on to graduate school in physics even though the job market fell out for physicists during the 70's. My first teaching was in the intro courses and labs, modern physics, and astronomy.

One of Drew's expectations for me was to introduce astronomy into our curriculum. Tapping into an NSF grant for science curriculum improvement at Drew, I bought our first telescopes, a Celestron 10" and a Questar. Drew built us an observing deck on the roof and we were in the astronomy business. Astronomy classes quickly grew to

We got the Drew van stuck...and then tore off their wooden toll gate on the way out. I acquired the nickname "crash" for some period following this.

80-90, and I had great fun talking about the many exciting NASA lunar and planetary successes during the early 70's. (It still seems strange to me today that our current students missed this incredible period of space exploration - it will never be done a second time.) I recall observing and photographing a

number of rare events during this period - two transits of the Sun by Mercury in 1970 and 1972, a total eclipse in North Carolina in 1970, and another eclipse expedition with 2 students to Nova Scotia in 1972, and of course Comet Kohoutek in 1973. In 1973, I wrote an unsuccessful grant to the NSF for an observatory dome, but given the popularity of the astronomy program, Drew agreed to fund it anyway. A chem professor (Greg Nelson) and I spent a long weekend with two dome builders that summer constructing our current dome. It was very exciting and now Drew had a real observatory.

After a Bell Labs adjunct faculty member left the area, I began to teach the advanced lab. A successful (this time) NSF grant brought new equipment and the current format for the lab (a number of mini-projects during the course). The early 80's brought our first computers to the lab with the HP-85s and computer control of experiments via the IEEE interface. It's hard to imagine now that they had only 32K of memory! A collaboration with a physical chemist (Jim Mills) brought Physics 14, our instrumentation (now electronics) course into being in the mid 70's. It was alternately taught by chem and physics with faculty from each department sharing it. After chem left the venture in the 80's, the

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Wedding Bells and Physics Hell - Seniors Admit Future Plans

SARAH ADAMS

Graduation will bring a lot of major changes in my life. As many of you know, I will be marrying Marcus Zumwalt (CLA '96) on July 5. The wedding will be in my home church in upstate New York, after which we will be moving to Mississippi. Marcus teaches elementary school with Teach for America, so we are obligated to stay there for one more year. I am applying for alternate route certification and have begun to look for a job teaching high school physics. The prospects look quite good. It will certainly take some adjusting to married life and to living and teaching in the Mississippi Delta, a region characterized by poverty and segregation. Nonetheless, I'm excited.



HELEN GEIB

Next fall I'll be starting classes at John Marshall, a private law school in Chicago. Marshall has a very prestigious program in intellectual property, the field I'm interested in (for anyone wondering, that explains the physics: ip includes technology law such as patent and communications, science and public policy, and so on as well as entertainment). I'm looking forward to living in Chicago, which is a fantastic city. It's also 9 hours closer to home than Drew, which will make a nice change. Marshall's offered me a full tuition merit scholarship plus stipend, so I should even be able to afford life in the big city. The scholarship also proves that it pays to major in your worst subject, as long as your worst subject happens to be physics and you're going into a non-science field. Many thanks to all the physics profs who encouraged my very non-traditional interest.

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course was changed more or less to its current format with integrated circuit bread boards and upgraded instrumentation.

In 1983 we made the big jump to computerize the general physics lab. We must have been among the first to do this, but IBM PCs weren't ready for this yet, and I bought Apple IIe (maybe the only Apples ever on the campus) computers that were interfaced through the game port. And so timing gates, temperature, and voltage probes came to the new lab. Most of our lab experiments were upgraded as well during this period. It was fun work and students quickly came to enjoy the benefits of taking lots of accurate data, and using Graphical Analysis (even bio and chem students could be found in the physics lab doing graphs for their other courses). Ten years later the Apples were retired and upgraded with 486 machines allowing the lab to be used as a general purpose computer lab.

SPS has always been among my most enduring interests. Shortly after I arrived, I began the Taco Party and Spring Picnic, and I recall there being some great party people during those early years (there was even wild dancing in my kitchen on at least one occasion!). One of our most memorable trips was probably to the Air and Space Museum in Washington, where we got the Drew van stuck in the low ceiling underground parking lot, and then tore off their wooden toll gate on the way out. I acquired the nickname "crash" for some period following this. The Drew chapter has regularly been among the most active in the country, and both I and many of our students have had the good experience of participating at the national council meetings of SPS.

My good friend, mentor, and colleague, John Ollom, decided to retire in 1988. It was hard for me to imagine Drew physics without him down the hall. My sadness at his leaving was ameliorated somewhat by Drew's decision to let us add another member to the department. (We are fond of saying that it took two people to replace John!) Pat Boeshaar and Jim Supplee were hired that year and essentially a new chapter for Drew physics began. The number of majors grew slowly, including a significant number of women for the first time, and our observatory moved to the big time with a new 16" computer controlled telescope in 1993. Our majors now regularly go off to competitive summer research opportunities, and an increasing number are doing independent study and research projects here at Drew. Students are considering a wider array of related fields for their work after Drew including engineering, education, law, and medicine - a good trend for our department. And finally, in September of 1997, a young experimentalist, Raychel Namiotka, will join us as the fourth member of our faculty. I see good things ahead for Drew physics!

- Dr Robert Fenstermacher

HEATHER HUGHES

My life at the moment bears a striking resemblance to those *choose your own adventure* books I had when I was a kid. You would read the story, and every page or two you got to decide what you wanted the main character to do next, so sometimes you got eaten by the green slime, and other times you were elected president. Never one to follow the rules, I always looked for the good endings and worked backwards. Unfortunately, that isn't an option for me right now.

After a lot of soul-searching, I have decided that, despite my strong calling to teaching, I would much prefer to work as a counselor of at-risk adolescents. Due to the nature of psychology graduate programs, this has forced me to put things on hold for a year. In the interim, I will be either attending graduate school in secondary education (at NYU, Columbia or SUNY Albany) or working as a teacher (I have been considering a position at a private school for dyslexic students), or working with my psychology minor in some other capacity. For the moment, my only concrete graduation plans are to invest in some furniture, buy a bicycle, and get a tattoo. And no, it won't be of Maxwell's equations.

JON PALEY

Well, it's hard to believe that my time here at Drew is rapidly coming to a close. After four years of late nights of caffeine highs, staring at physics texts until my eyes hurt and discussing physics homework with my classmates until my ears hurt, and forests worth of scrap paper with mathematical equations written everywhere, I have decided that I cannot think of a better way to live and will continue on with physics at Boston University in a PhD track program. I am still undecided as to what area of physics I will concentrate on, but I am fairly certain that I would eventually like to teach physics on a college level.

Although I look forward to my adventures at BU, I will certainly miss Drew, my classmates and my professors. The physics department may be small in number, but I know that it will be very difficult to find another environment that is at the same time incredibly supportive, active, and fun. I wish to give a special thanks to all the faculty in the Physics Department for helping to make my four years at Drew so productive and enjoyable.

RUSS CASTONGUAY

Hello physics people, I'd like to say a few things about my plans and my physics experience. We've been through a lot: Ampere's law and talks by Nobel Prize winners; the uncertainty principle and field trips to Bell Labs; spinning mirrors and trouble with gamma ray detectors; to picnics and "physics humor." It's been a fun trip.

Next fall, I'll be going to Rutgers University, staying in New Jersey, doing a PhD in theoretical physics. I did a second major in computer science, so I may end up doing computational physics. Once I get out in the real world, there's a big question mark...everyone keeps telling me I'll end up on Wall Street. Well, I have no real plans, but I can't wait to see what happens. Enjoy the summer, and don't be too embarrassed to tell people you're into physics - change their preconceptions.

Congratulations!

Arnold S. Boxer Memorial Prize in Physics...*Jon Paley*

Novartis Award in Physics...*Russell Castonguay*

John F. Ollom Prize in Physics...*Rebecca Fraser, Christopher Perry*

Slipper-McClintock Prize (to outstanding Drew Scholar)...*Helen Geib*

SPS Officers for Next Year

President Rebecca Fraser

Vice-President Chris Perry

Activities Director Bridget Sullivan

Newsletter Editors Alice Chu

Zenia Helbig

Jeanine Turner

WORDS OF WISDOM FROM GRADUATING PHYSICS MAJORS

HELEN: “The most important thing is to keep up week by week. Four long years of physics has taught me that. (A study habit I’ll carry with me to law school.) Also, if at all possible, you should go abroad. It’s a great experience, besides, it gives you a break from Drew. “Don’t be discouraged from majoring if you’re not an A student - physics is fantastic preparation for any field, not to mention the fact it looks really great on the resume. As long as you enjoy learning physics, it’s worth the extra effort.”

JON: “To those who are starting out in the major, some advice:

- Start your work early if sleep is important to you;
- If you get stuck on a problem, and it’s allowed, talk to a friend;
- Apply for at least one, if not two, summer REU or other physics-related internships - they’re great fun and an incredible learning experience even if you don’t plan on going on in physics.

“Best of luck to everyone in all your future endeavors!”

HEATHER: “First and foremost, I would advise future physics majors to find a vice. Quickly. Seriously, though, find a way to enjoy the free time that is available to you. Be social. Go to the pub. Make friends who can’t perform integrals. No matter how much you enjoy the world of physics, you will always be a part of the real world as well. “Along this same vein, I also suggest that you minor in a humanity. Take the time to learn not just how particles interact, but how people do. Bring your logical thinking to English or history to offer a new perspective. There exists a stereotype of the antisocial, introverted scientist. Challenge and change it.”

ALICE ATTRACTED TO FRUIT FLIES IN SUMMER ‘97

I will be interning at the Cold Spring Harbor Laboratory Undergraduate Research Program from June 8 to August 16. My mentor is Dr. Tim Tully in the Beckman Neuroscience center, and his project focuses on the molecular neurobiology of learning and memory in *Drosophila* (which are icky yucky fruit flies). My guess is that I will be breeding zillions of fruit flies this summer, squishing them, and looking at their beeeeyooootiful DNA to analyze where the genes for learning and memory are.

How did I get this spectacular opportunity to work with disgusting insects, you ask? Well, I learned about this program on the Internet and applied. The deadline was the first of February, so it was probably the first of the eighteen (or was it nineteen? I can’t remember. Dr. F. would know best, the poor man had to write all of my recommendations) summer applications I sent out this year. It was also the second one I heard from, so I guess in some twisted way that tells you the early bird gets the worm or whatever.

Anyway, it was one of my top choices for an internship, and I am thrilled to be going. There will be approximately twenty of us URPs (that’s what they call us) and we will be housed, fed, and paid a stipend. Some of the perks that come with it are that we will be going on a bunch of social activities, including a Broadway show and pool party, and that we will be invited to schmooze with scientists at all of the Cold Spring Harbor course banquets and picnics, et cetera. It is really a top-notch place to do biology research, and I’m looking forward to expanding my knowledge of neuroscience. Last summer my research was in neuropharmacology and I mostly did binding assays. While I learned a tremendous amount about pharmacological techniques, I’m also very excited about learning a new aspect of neuroscience and I look forward to morphing from a pharmacologist to a molecular biologist. Except that I have a

p h o b i a a b o u t f l i e s . J u s t
k i d d i n g .

More Words of Wisdom

SARAH: “My advice to incoming physics majors would be to work hard but keep a sense of humor. Don’t be afraid to ask for help from professors or other students because you will come to understand a lot more of the material that way. Also, try taking some classes outside the sciences to challenge your perspective and expose you to different ways of thinking. Above all, make the most of your time at Drew because the years will go by quickly!”

RUSS: “I have three pieces of advice for the next generation of physics majors: First, read as much of the textbooks, and those *Physics Todays*, as you can. Ask lots of questions, that’s one of the great opportunities at a small school and especially in our cozy physics department. Most importantly, do a summer internship. Mine was an incredible experience. You won’t regret it. I mean it. Do two if you get the chance.”

Notes from the Outside

Current Research Interests:

I’m working as a Postdoctoral Research Fellow at the University of Michigan and am one of a 500+ member collaboration which studies the fundamental particles of the universe using the CDF detector at Fermilab. I’m helping to design, construct and test elements of the decision making (trigger) system for the to-be-upgraded detector, in anticipation of the 1999 running period.

My Ph.D. work was on the self interaction of electroweak gauge bosons (we scooped our European competitors by many years) and will soon be published in Physics Review Letters. I occasionally revisit this subject, but my future interests involve precision measurements of the top quark.

Drew Experience:

While I am still very early in my career, I can point to several elements of Drew’s physics program which helped me along my way:

Subject matter - Drew offers a surprisingly full menu of physics courses, as well as highly relevant math and comp sci classes. In graduate school, there were very few subjects that came as a complete surprise to me, and there were even

a couple which a corresponding class that I had taken at Drew made unnecessary! In particular, my undergraduate exposure to linear algebra, complex analysis, differential equations and computational methods was more than adequate for the graduate curricula at Notre Dame. I feel that this broad-but-detailed undergraduate training was made possible because of Drew University’s commitment to a liberal arts education. The inherent flexibility of Drew’s CLA makes it possible for physics majors (with a necessarily tight schedule) to fit useful classes from outside the physics department into their schedules.

Electronics/Laboratory experience - In my opinion, this is the strongest aspect of the physics major at Drew. With two introductory laboratories, a dedicated electronics class and two semesters of advanced laboratory, Drew physics provides an excellent training ground for junior researchers. Familiarity with multimeters and oscilloscopes is an important skill that can only be learned with the type of hands-on experience that is offered at Drew.

The two-semester advanced lab is great preparation for more advanced, graduate level (and beyond!) research. The preparation of coherent papers and cogent presentations is a skill which is

emphasized in the Drew lab course that is lacking in many other undergraduate physics programs. I found myself at no disadvantage when working with students from universities that offer graduate degrees in physics.

Computer initiative - There are no fields of physics (and few fields in or out of science) which do not rely on a person being able to interface successfully with a computer’s CPU. In my field, all data analysis relies explicitly on computers. Even in my current hardware oriented role, I use a variety of different programming languages to design and diagnose equipment. Drew’s commitment to making all students familiar with modern technology certainly makes it easier for alumni to confront initially confusing computer systems.

As you can tell, I think Drew’s physics department (not to mention the University as a whole) has a tremendous amount to offer, especially to someone considering graduate work in physics. The robust nature of the Drew physics major, along with the rest of Drew’s liberal arts curriculum, is a powerful combination.

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Quotable, but maybe you had to be there...

Overheard at the SPS Banquet...

Russ ...I read a book on cable access once...
...I think about the most I have patience for is a video aquarium.

Sarah ...Jon's the great idealist, Heather's the great pessimist, and I'm just great.

Dr. Carter ...I know I've had a few glasses of wine, but what did I just agree to?

Heather...I heard the words "total surface area" come out of your mouth...

Catherine...I was talking about shaving!

Jon (to Helen)...If you ever want to experience a night in Hoyt...

Jon ...Orgasmic...

Sarah ...I was just thinking that...

Sarah (to Jon) ...I did notice that you're looking particularly thin. I think it's your pants.

Russ ...They must not be tight enough...

And in class....

Dr. Supplee ...Lagrange's equation makes you want to burst into song, doesn't it??
...When there's a letter missing from the Lagrangian, you do a little dance.

Dr. Fenstermacher ...I've escaped being quoted for three years...
...I may know the orbit of the moon around the earth to twelve decimal places, but I can't tell you what that is on your arm there.

Summer Internship

"I've always wanted to go to Israel, but I never thought that physics would be my ticket to the Holy Land," said junior Matthew Diamond. This summer, Mattathias (Matt's Hebrew name) will be one of 20 Israeli students at the Karyn Kupcinet International Science School. His mentor at the Weizmann Institute in Rehovot in the Department of Membrane Research and Biophysics will be Dr Doron Lancet, head of the human genome Project there. Matt looks forward to ten weeks of falafels, his favorite Israeli food.

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