



Professor



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I am a professor at Penn State University, but my job for NASA right now is as the co-chair of NASA's TPF1 Science and Technology Definition Team. TPF1 is the Coronagraphic version of NASA's Terrestrial Planet finder mission. This is one of two missions that NASA hopes to send space-based telescopes to look for Earth-sized planets around other stars. The Coronagraph will look in the invisible and near infrared light using a big 8 x 3.5 meter mirror.

My areas of expertise

- Math
- Physics
- Chemistry

How I first became interested in this profession

I became interested in this while growing up in Huntsville, Alabama. I just happened to grow up in one of the big space centers in the US. My father was working for General Electric, which was subcontracting for NASA. This was back during the time when the US space program was first getting going with the Mercury, Gemini, and Apollo spacecraft. Many of the engines for these spacecraft were developed at Redstone Arsenal in Huntsville, so I think I knew from a very early age that I was interested in space, and I wanted to do something related it.

What helped prepare me for this job

What helps to prepare you is to work hard on your academic studies. I've been involved in this field for a long time now. I got my Ph.D. at Michigan and did two post docs, one at the National Center for Atmospheric Research and one at NASA Ames Research Center. I worked in the space science division at NASA Ames for about five more years and then I came to Penn State. So if you go into academics or space research, you can expect to spend many years learning what's useful to the discipline.

My role models or inspirations

One of the first ones was my Ph.D. Academic advisor at Michigan, Tom Donahue. He was the planetary scientist who was very involved in the Pioneer Venus mission and also later in the Galileo mission to Jupiter. Also, Jim Walker inspired me, who wrote a book on the evolution of the atmosphere more than 25 years ago. Then I worked with Jim Pollack at NASA Ames, who was a very well-respected planetary scientist. He was Carl Sagan's first graduate student. Both Jim and Carl have passed away now, which is unfortunate. The other person who's been a real mentor to me is Dick Holland of Harvard, who has worked for many years on questions such as the rise of oxygen in the Earth's atmosphere. So I've been fortunate to learn from some very good scientists.

My education and training

- Degree in Chemistry and Physics at Harvard University
- Graduate work in atmospheric sciences at University of Michigan
- Two-year post doc at the National Center for Atmospheric Research in Boulder, Colorado
- Two-year post doc at NASA Ames Research Center

My career path

- Five years in the Space Science division at Ames
- Sixteen-and-a-half years at Penn State in the department of Geosciences

What I like about my job

I like it when I have enough time to work hard on a research project. I also enjoy it when I've got a good class on a subject that I like to teach. This semester is Spring '05. It is one of my favorite semesters, because I have a graduate-level class in Astrobiology with 10 students from all sorts of different disciplines. I have another class in Numerical Modeling with about eight or 10 students where I get to work one-on-one with them on programming.

What I don't like about my job

We've got too many things that we would like to do, and there's not enough time to do all of them as well as one would like. If you're a professor, you're trying to research, and you're trying to teach classes in the same time you're trying to perform some kind of service for other organizations such as editing journals. I've got at least three different bosses, and it's hard to do everything well.

My advice to anyone interested in this occupation

My advice would be to work hard as an undergraduate. Get yourself a good technical background, but also don't just restrict yourself to getting a technical background. Some of the courses that have been the most useful to me were English and Speech, because if you're a successful scientist you'll end up giving talks. Learning how to give talks is a plus. Also, if you're any kind of practicing scientist, you have to write up your research in research papers, and people will read those more if you write them well.