

PROFILES OF SCIENTISTS IN EDUCATION AND PUBLIC OUTREACH

This profile is based on excerpts of an interview with Dr. Fran Bagenal, about her involvement in Education and Public Outreach (E/PO), specifically her role in NASA's New Horizons mission. Dr. Cherilynn Morrow of the Space Science Institute (SSI) designed the interview questionnaire. SSI's Preston Dyches edited the responses in May, 2003.



Current professional position:

Professor, Dept. of Astrophysical and Planetary Sciences, University of Colorado at Boulder, and Research Associate, Laboratory for Atmospheric and Space Physics. I'm also the science team liaison and plasma science team lead for the New Horizons mission to Pluto and the Kuiper Belt.

Description of Fran's featured E/PO role:

One of my roles with the New Horizons mission will be to find scientific material that is useful to its E/PO activities. Kids who are in grade school now will be in college when the mission reaches Pluto, so there's an opportunity to follow the mission through their entire school career. One of the most exciting things is the Student Dust Counter experiment because graduate and undergraduate students will be involved in building it, designing it, and doing some of the science. There won't be a lot of students involved directly, but we will support those students in reaching out to younger students.

How she became involved in the project:

Usually, as I get involved with missions, I become involved with the E/PO. I really got interested in Pluto years ago when I realized that in some ways it's like a very extended comet and has quite a dynamic interaction with the solar wind.

How she balances E/PO efforts with other professional activities:

As a university professor, most of my time is split between teaching and doing research. E/PO is the bridge between the two, so it's hard to say when I'm specifically doing E/PO or research or teaching, because they're all intermingled. I find that I often use the stuff I develop for my introductory science teaching for E/PO purposes and vice versa. So when I give

public talks, for example, it's been really helpful to have already thought through how to demonstrate something like the pressure at the center of Jupiter (70 megabars is equivalent to the weight of one hundred elephants, with the bottom elephant standing on one foot, wearing a stiletto heel.)

Challenges to her E/PO involvement:

It's one of the problems of financing space missions that the E/PO side can take a while to get going. At this stage of New Horizons we've got an outline of what we want to do, but substantive E/PO funding doesn't kick in for a year or so, and thus we have to really stretch to get much done early on in the process.

As a woman in science it sometimes seems that I get a proportionally greater number of requests to contribute to E/PO. E/PO comes on top of the other jobs that I'm doing, and I have to be really careful not to over-commit.

The most important positive impact of her E/PO work:

I think there's a huge opportunity to provide interesting material from solar and space physics for introductory undergraduate physics and astronomy classes. There must be several million people across the country taking these intro courses at any one time, and it would be good to take small pieces of solar and space physics and tie it directly to that fairly standard curriculum. Several groups have recommended this, including the Solar and Space Physics Decadal Study in which I participated.

Fran's words of wisdom about E/PO:

The techniques of inquiry-based teaching for K-12, where you have classes of 30 students, are not the same as those used in undergraduate classrooms of 300. The *principles* of learning might be similar, but the techniques have to be very different. It's good to understand both the principles and the variety of techniques for implementing them for different audiences.

Choose the sort of E/PO you're really interested in doing and limit it rather than getting torn in too many directions at once. Don't try to 'do a bit of everything'. Otherwise, you may end up overextended and your research or other commitments will suffer because of it.