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[Woman and Science](#)

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Women in Science

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These sidebars by Barbara Figge Fox were published in U.S. 1 Newspaper on January 21, 1998. All rights reserved @HEAD 24 = Ruth Daly: Persistent Astrophysicist

Ruth A. Daly made international news earlier this month for her discoveries about measuring the universe. An assistant professor and theoretical astrophysicist at Princeton University, Daly had postulated a cosmological model representing the expansion history of the universe; her model says the universe will not halt and recollapse on itself. Harvard/Smithsonian and Berkeley researchers, using a different method -- the maximum strength of supernovae -- have just come to the same measurement conclusions (New York Times, January 9).

"We can say, with 95 percent confidence, that the universe is open and will continue to expand forever," says Daly. "We are the only other group with a method -- my method that I published in 1994." "The supernova people are using somebody else's method. Our number has been out for two years. From my point of view they are confirming *our* number."

Women who want to be scientists need to find good mentors and be careful what advice they take, Daly says. Her own strategy is "to do lots of really interesting and important work and hope that someday it will account for something."

In college she had been shunted to the liberal arts. "I have always been interested in the stars," says Daly. "I was at the top of my class in math and science at Boston College, but when I went to the counseling center at the end of my sophomore year, I was advised to switch to the humanities. My advisor said I should really be in special education."

This was 1977 and the feminist movement was in full swing, so Daly can't imagine why that advice was given -- and doesn't say why she took it. But by the time she discovered the suggested major "wasn't a good use of my talents" she was too far off track to go back

to science, and only later did she go back to get her advanced degrees in physics and astronomy.

Daly grew up in a family of nine in West Springfield, Massachusetts, where her father was a psychiatrist and her mother, a former Rockette, was nationally active in such arts groups as the Sweet Adelines. She left high school a year early and graduated from Boston College, Class of 1979, as an English and psychology major.

The psychology training wasn't, after all, a total loss: "There is an interpersonal element to science," says Daly. "Many scientists are completely blind to understanding motivations and prejudices. Having read a lot of psychology helps me to understand the politics and interactions, what is motivating people, and why they have the perspective they have."

After working in Scotland, she returned to Boston University for master's and doctor's degrees in physics and astronomy. After postdoctoral work at the Institute of Astronomy in England, she came to Princeton in 1988, and joined the faculty in 1990. She has taught two graduate courses, and is currently teaching physics for engineers. Rather than do the actual observations, she is a theorist, working with pencil and paper and trying to look at what is known with a different perspective.

Daly married Russell Mina, a poet who is also in the pet business, and they have daughters, 2 and 1. At the time of this interview Daly was packing her daughters' suitcases so they could stay with relatives while she and her husband went to a meeting in Europe.

Now, about that science of hers: Imagine all space constantly expanding, Daly explains. "If you are sitting at one point, the farther away something is, the higher the velocity at which it is moving." This velocity of recession is called the "red-shift." "The `distance' depends on the global geometry of the universe," says Daly. "The precise relationship between red-shift and distance tells us the expansion history of the universe -- and its fate."

"Now we have taken the data -- our predictions and our observations -- and folded them through our radio source model, matched it to our observations -- and compared it with what is expected by other cosmological models. The match-up is stunning," says Daly. "It is concrete proof."

Perhaps because of her college advising experience, perhaps because of her psychology perspective, Daly questions whether women are receiving sufficient encouragement to pursue careers in astrophysics. In the theoretical arena (postulating theories rather than concentrating on observations) she says that one percent of women are at her level and overall women represent two percent of researchers nationally. She wonders whether these ratios might reflect the subjective component in evaluating theoretical work, as opposed to experimental work or more concrete observational work. "It's not that women are not interested or motivated or smart or working hard," says Daly.

Mentoring, she believes, is extremely important: "If you work with someone who is supportive and will play the role of a mentor that could make a big difference." For her PhD thesis she worked with Harvard's Nobel prize-winner Sheldon Glashow. "Shelley is a category unto himself. I don't think he knew that I was a woman -- he is purely cerebral. I loved interacting with him because my gender was not an issue. We had wonderful scientific discussions."

She tries to make sure her own door is open. "That's important. I mentor both men and women but I am particularly sensitive to the experiences that women have that men don't have."

Daly stops short of saying that her work has been given less credence than if she were a man but notes that public relations is "a huge component" to science. "I have been working on other projects. They spend a lot of time making sure the press is aware of their projects. Our numbers are two to three years old but we haven't been calling the reporters -- we have been giving the results at scientific meetings. We have other results which I think are more important than this."

"Unfortunately there is a certain amount of promotion in science, more so than the public is usually led to believe, but other scientists usually recognize self promotion for what it is," agrees David T. Wilkinson, professor of physics at Princeton. "If you really want to impress your colleagues you'd better do good science rather than be out there promoting yourself."

Daly acknowledges it "would be fun" to win one of the major prizes, "but I am more interested in finding out what is happening in the universe, having the stimulation of figuring things out."

Says Daly: "The advice I would give to women coming along -- don't listen to people who dismiss your work as not interesting or important. Don't allow anyone to tell you that what you are doing isn't right up there with what everyone else is doing."

-- Barbara Fox