

CAREER CHOICES

Bringing Physics to the People, Texas Style

It's 7:40 am on a weekday, and Mary Beth Monroe is starting out on the 40-mile drive into town. She's been up since 5:30, getting ready for work and seeing to a few of the many chores that come with living on a 6000-acre cattle ranch. But it's not until she arrives at the campus of Southwest Texas Junior College that her workday begins in earnest.

Monroe is a physics instructor at a two-year college. According to figures compiled by the American Association of Community Colleges, the 1300 or so two-year colleges in the US enroll about half of all first-year college students, and over 40 percent of the students who take introductory physics do so at a two-year college. Even so Monroe and her colleagues often struggle to define their place within the education establishment and the physics community.

Recruited by physics

Monroe did not set out to be a teacher—or for that matter a physicist. While still in high school she had her future mapped out: She'd go to college, earn dual degrees in chemistry and library science and then become an industrial librarian at an oil company. Instead, because her family was not well off financially, Monroe enrolled at Sam Houston State University in her hometown of Huntsville, in eastern Texas, where she'd been offered a physics scholarship.

From the very first day, Monroe recalls, "a campaign was launched in the physics department to get me to major to physics." When she failed to show up for the first meeting of the Society of Physics Students, the other members appointed her program chair in absentia. The faculty would "cook up reasons for me to go by the research labs," where she'd be asked to help out with whatever was going on. "Through the family environment within the department, they let me know that my capabilities were good enough to study physics." Monroe saw this happen with others as well. In the class that followed Monroe's, there were five women physics majors; one of them, Karen Johnston, is now a professor at North Carolina State University and president of the American Association of Physics Teachers.

Monroe got her first taste of teach-

ing during her sophomore year, teaching a lab course for education majors. She also joined AAPT that year, and she and other students would tag along with their professors to meetings. "I sort of grew up in the Texas section of AAPT," Monroe says.

While still an undergraduate, she began working with Charles Manka's research group, analyzing superimposed plasma pulses; this project eventually became Monroe's master's thesis at Sam Houston. To put herself through grad school, Monroe accepted a grant from the US Department of Health, Education and



MARY BETH MONROE

Welfare, which required that she take education courses focusing on junior college teaching in addition to her regular physics coursework; she also taught part-time at Tarrant County Junior College, where she used an experimental self-paced curriculum. "Until that point I had never thought much about finding new ways to teach," Monroe says. "I knew I liked teaching, but I kept thinking about that old cliché: 'Those who can do and those who can't teach.'" But by the time she completed her MS in 1973, she had decided she would be a teacher and if possible at a two-year college, even though that would mean giving up her plasma research and never teaching an upper-level course.

With her connections in AAPT and the Texas physics community, Monroe probably could have landed a job in a

metropolitan area. Instead she chose Uvalde, a small town two hours' drive west of San Antonio. "I guess it was the missionary spirit in me," Monroe says. She has been there ever since.

Many of her students walk into class ill-prepared to do math or science, and so her first step is overcoming their fear of physics by helping them realize that physics is relevant to everyone. "I truly believe if people study and appreciate science, their reasoning will improve significantly and in the end they will become better citizens. I cannot imagine a well-rounded education without science—and more specifically without physics."

For her students who decide to transfer to a four-year college, Monroe may arrange scholarships, and she makes sure they have someone at the school to turn to for advice, to help ease the transition shock that many transferees experience.

Although Monroe received tenure at Southwest Texas in 1985, her job brings few of the usual perks associated with academic life. There is no sabbatical leave, for example, or secretarial support, and oftentimes, as is the case this year, Monroe has no lab assistance. These days she communicates with colleagues primarily by e-mail, using a computer and modem she bought herself.

But Monroe is not really complaining. Working at a two-year college gives her great flexibility to try new teaching styles, textbooks and curricula, she says. She also relishes the ties she's formed with the local community. Each semester she and her SPS students do two or three demonstration shows in town, and she has helped local precollege teachers cope with changes in the science curriculum.

Family life

When Monroe moved to Uvalde in 1974, she had no family or friends close by, and she spent most weekends working on campus. A student who often stopped by the office to chat grew concerned. "She thought it was unhealthy for me to be working so much," Monroe recalls, and the student invited the overworked teacher to visit the family ranch. In the process she met the student's brother, James. A year later he and Mary Beth got engaged.

To juggle her roles as wife, mother

and educator, Monroe says, "I constantly, daily have to reestablish my priorities." This proved particularly hard when the children, Julie and Todd, were infants. "Back then I was teaching 27 'contact' hours per semester and doing my own labs. After teaching all day, I'd leave the college around four in the afternoon, pick up the kids at day care, drive an hour back to the ranch, cook dinner and then do my school work. It was all so fast paced that I cannot remember a lot of the details about my children's young life. I do feel guilty about that."

She might have left teaching at that point if it had not been for her husband. The manager of the ranch where the Monroes live, he sometimes accompanies her to professional meetings and otherwise encourages her to stay involved. Only recently did she learn that during a national AAPT meeting many years earlier, Len Jossem of Ohio State University had pulled James aside and urged him to support Mary Beth's career.

Like many of her colleagues, Monroe is the only physics instructor at her school. "If I can't work a problem, I have to call somebody in San Antonio or elsewhere." Then too she must deal with the low social status afforded her profession. "There's kind of a stigma" about being at a two-year college, Monroe says. "It's frustrating not to be considered as competent as a four-year college teacher by some in the physics community."

An AAPT project led by Monroe and Carol A. Lucey of Alfred State College of Technology in New York addresses those issues. Called Two-Year Colleges in the Twenty-First Century, or TYC21 for short, it sponsors regional and national meetings where participants can gather and talk about physics teaching and other concerns specific to two-year colleges. Another goal of the project is to heighten awareness of two-year college programs within the rest of the higher education community as well as business and government. The National Science Foundation has funded TYC21 at \$1.18 million for four years.

Making the project succeed will require a lot of commitment, Monroe concedes. "We're working with people who are already overworked and underpaid." But as physicists search for ways to convince society that what they do is relevant to everybody, she hopes they will soon realize the role that the two-year college can play in bringing physics to the people.

JEAN KUMAGAI ■

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ANDREW GEMANT AWARD Call for Nominations

The Andrew Gemant Award of the American Institute of Physics recognizes the accomplishments of a person who has made significant contributions to the understanding of the relationship of physics to its surrounding culture and to the communication of that understanding. The Selection Committee invites nominees for the 1996 award.

Criteria

The awardee is chosen based on contributions in one or more of the following areas:

- Creative work in the arts and humanities that derives from a deep knowledge of and love for physics
- The interpretation of physics to the public through such means as mass media presentations or public lectures
- The enlightenment of physicists and the public regarding the history of physics or other cultural aspects of physics
- Clear communication of physics to students who are learning physics as part of their general education

Nature of the Award

The awardee will be invited to deliver a public lecture in a suitable forum; the awardee will receive a cash award of \$5,000 and will also be asked to designate an academic institution to receive a grant of \$3,000 to further the public communication of physics.

The award is made possible by a bequest of Andrew Gemant to the American Institute of Physics. The 1996 Award will be the tenth. Past awardees include Gerald Holton of Harvard University, Cyril Stanley Smith of MIT, Martin Aitken of the University of Oxford, United Kingdom, Abraham Pais of the Rockefeller University, Spencer Weart of the American Institute of Physics and Robert Wilson of Cornell University.

The awardee will be named by the AIP Governing Board in March 1996 based on the recommendation of an outside Selection Committee appointed by the Institute's Board Chairman.

Please send nominations with supporting material to:

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Director of Physics Programs
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Deadline for nominations is 31 December 1995.

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