

# Outreach and Variety

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When I look back on my education and career choices, I see individual teachers who had a tremendous impact. I was encouraged at an early age

by my teachers at Catholic schools in Louisville, Kentucky. I could do mathematics well and could explain mathematics well to others. Teachers in eighth and ninth grades gave me the opportunity to teach other students. Since I was about twelve years old, I wanted to be a teacher. So I feel that I was born to teach.

At an all-girls high school, two teachers, Sisters Doloretta and Theodora, encouraged me in mathematics and science. I had the chance to work at my own pace. The atmosphere at this school made it easier for me to feel comfortable about excelling in mathematics and science.

When I was taking Calculus I at Bellarmine College, my professor, Ralph Grimaldi, started to encourage me to prepare for studying mathematics in graduate school. He even taught me number theory in an independent study course during the summer after my freshman year to teach me about proofs. Through a cooperative program at my college, I could increase the number of courses available to me by taking courses at the nearby University of Louisville.

When starting graduate school at the University of Kentucky, I did not know what area of research I would pursue. I chose partial differential equations after taking my first PDE course during my second year of graduate school—this after having taken no PDEs as an undergraduate. So now I tell students it is okay to go to graduate school undecided about research area. Graduate school can open new horizons and interests in a variety of directions. My advisor, L. C. Evans, did a good job of training me to do research. My dear friend, David Adams, has mentored me, starting in graduate school and continuing through the present. I became interested in mathematical biology through an interdisciplinary modeling course in graduate school, and that interest continues in my work today.

When I earned my Ph.D. in 1981, there were few postdocs available, so I obtained a tenure-track job at the University of Tennessee (UT). At my first day of work, I was shocked into the realities of the job when I was informed that I should write an NSF proposal that month.

I try to keep an open mind about the variety of research problems to work on. I have always been willing to work on problems outside my area of specialization. I am willing to learn something new and try to apply it. This willingness led to collaborations with Curtis Travis, George Wilson, and Vladimir Protopopescu, all from Oak Ridge National Laboratory. The collaboration with Travis helped me get started early in my career. My collaboration and friendship with Protopopescu has been very positive and fruitful and still continues. Interactions with researchers in the UT Department of Ecology and Evolutionary Biology continue to be very beneficial.

I started working as a part-time researcher at Oak Ridge in 1987; this laboratory is managed by UT-Battelle for the Department of Energy. I work in the Complex Systems Group of the Computer Science and Mathematics

Division. It is great to go there one day a week and talk with Protopescu about current projects. We have worked on a variety of things over the years, partly directed by the current research goals of our section of the laboratory. The diversity of work has been very interesting, with topics including combat models, robots, bioreactors, and lasers. Working at a national laboratory is quite different from university work. The direction of the research is driven by the availability of funds and the current focus of the Department of Energy (DOE). Researchers spend a great deal of time writing proposals to find funding to cover their time; proposals are written to various government agencies, such as DOE, Department of Defense, and NASA, and sometimes proposals are for cooperative projects with private companies. (Yes, even though ORNL is a DOE laboratory, proposals for the major thrusts of a group's work must be written to DOE.) Of course, publishing in refereed journals is also very important in our section.

I am able to do what is important to me—teaching, research, and service in the form of encouraging students. I have been directing a Research Experiences for Undergraduates (REU) program for many years and hope to continue this work. Service to the mathematics and the local communities is important to me. I have been involved in after-school math/science clubs for middle school students for the past four years, and I currently coach a math competition team at a local high school. I continue to be involved in middle school activities through two workshops each year, called SHADES, SHaring ADventures in Engineering and Science. I feel that I am able to do so much volunteer outreach work because my workload at home is light, since my husband is currently a full-time homemaker. (He quit his computing job when I had the opportunity to spend a semester as the Sonia Kovalevsky Visiting Professor at the University of Kaiserslautern in Germany. We all went to Germany for four months, and when we returned, our son was starting kindergarten, and my husband became a homemaker.)

The REU site program is funded by NSF to give opportunities for undergraduate students. There are about thirty-five sites for such programs for undergraduate math majors across the country. In our program, ten students spend eight weeks in Knoxville working on research projects and attending two short courses and a faculty seminar. Each of our participants is matched with an advisor and works on an individual project. The goal is for the students to learn about the process of doing research and to participate in the process. We also try to educate the students about the breadth of mathematics. Our program has had about 50% female students over the years since its start in 1987. There are a variety of types and sizes of REU programs, giving opportunities and choices to many students.

I am glad to have served as president of AWM. I hope to see more women mathematicians across the spectrum of the mathematics community. I especially look for progress for women in leadership roles in mathematics organizations, in university governance, and in the professoriate at the top research institutions.