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Sharing the Beauty of Math: A Biography of Professor Bonfert-Taylor

In 1988, when Petra Bonfert arrived at the prestigious Oberwolfach mathematical research institute, she was the only girl in a team of fourteen. In fact, she was the first girl to ever participate in this team, a highly selective group of German high school students preparing for the International Mathematical Olympiad. Now, nearly thirty years later, Bonfert-Taylor is a professor of mathematics and engineering. Her career began in her native Berlin, taking her to the University of Michigan, Wesleyan University, and finally to Dartmouth College.

Speaking from her office in the Thayer School of Engineering at Dartmouth, she recalls her time at Oberwolfach. She tells the story of a male mathematician who, upon learning that she is the first girl ever selected for the team, explained: “Of course there aren’t any girls. They aren’t good enough!” This remark stuck with Bonfert-Taylor, as did the Institute’s policy of providing women mathematicians with napkin-holders distinct from those of the male mathematicians. A few years later, during Bonfert-Taylor’s Master’s program, a professor would tell the class that women are not playful, so they can’t be too creative in math. And throughout Bonfert-Taylor’s undergraduate and graduate school years, none of her professors were women. Such was the world that Professor Bonfert-Taylor came of age in.

Of course, the unusualness of finding a woman mathematician during the late 1980s was not lost on Bonfert-Taylor. Although her parents, an engineer and a school teacher, were very supportive of her as a child, she realized that many girls were discouraged from pursuing fields that have been dominated by men. She decided that she would help create a better environment for girls and women in mathematics and the sciences. And she has been doing just that.

After earning her PhD from the Technical University of Berlin, Bonfert-Taylor went to the University of Michigan for a one-year post-doctoral position. Bonfert-Taylor met her future husband on her first day, and ended up staying in the United States where she launched her long career in research and teaching.

When I asked her how she chose academia among other quantitative or mathematical careers, Professor Bonfert-Taylor explained her decision quite simply. She saw an inner beauty to math; “doing math” gave her a sense of satisfaction. (Her favorite mathematical formula is Euler’s

Identity.) This affinity for math, combined with her interest for fostering a better environment for women in the field, made academia a perfect fit. Professor Bonfert-Taylor's professional interests have included geometric function theory, complex dynamics, and the mathematics of medical imaging.

Over time, Bonfert-Taylor has been able to bring into her research her passion for making math more accessible. Currently, as a professor at the engineering school at Dartmouth, she has been working on instructional design. She explores learning analytics, an emerging field that is transforming the way classes are taught. She examines data to understand and improve students' experience and the learning environment. She adds, "I have become especially interested in pedagogical innovation that aids in providing equal opportunities to students from all backgrounds." She wants to be part of this educational revolution, in order to improve her own teaching and reach all her students. She finds this position to be exciting and rewarding.

Professor Bonfert-Taylor cares deeply about her students. She understands that being in college is difficult, and even takes the time to remind her students to eat breakfast. She recognizes the social aspects of learning as very important, and thinks of mentorship as a crucial part of the relationship between the student and the professor. Speaking about her students, especially female students, she says, "I try to share with them what I see in math."

When asked for advice for young women interested in pursuing a career in the mathematical sciences, Professor Bonfert-Taylor answered: "I tell them to not get discouraged. Female students tend to have more doubt than their male counterparts. I remember going to conferences and being afraid of asking dumb questions. I used to think of those who asked questions as smarter than me, but that's not the case."

In her own mathematical journey, Professor Bonfert-Taylor has helped many others become successful and confident in their studies and subsequent professions. When she is not teaching or conducting research, she loves spending time with her family; her husband, her two children (Elaine and Alexander), and their dog, Cannon. Professor Bonfert-Taylor also enjoys skiing, hiking, and baking in her free time.

About the student:

I am a junior at Dartmouth College, where I major in government and minor in neuroscience. I am interested in quantitative data analysis as a means of addressing the big problems and misunderstandings in public

policy. I have held several internships and research positions where I would use mathematics every single day. It is a field I respect and value very much. As for my future plans, I hope to either attend medical school or pursue a career in public policy research. In my free time, I enjoy swimming, practicing the piano, and watching history documentaries.