

## A Mathematician's Journey From Mentee to Mentor: Reflections on the EDGE Program

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## A Mathematician's Journey From Mentee to Mentor: Reflections on the EDGE Program

### Cover Page Footnote

We would like to thank Dr. Ami Radunskaya for suggesting this piece. We are also grateful to the unknown referee for their careful reading.

# A Mathematician's Journey From Mentee to Mentor: Reflections on the EDGE Program

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## Synopsis

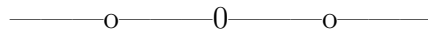
The programs supporting diversity in mathematics are as important as ever. So why are they losing funding? And what hope do they have of thriving in the current political climate? In this collaborative interview, two past participants of EDGE (Enhancing Diversity in Graduate Education) explore these questions; Sarah probes and narrates as Alejandra thinks out loud about the ways that the program has shaped her life and how she hopes to see the program continue.

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Alejandra has just returned from a run, and is back in her summer rental house, gathering her things in a rush to get ready to visit the EDGE math program participants at their evening work session. She is not sure if she will need paper or a laptop; these days, students use both interchangeably. Maybe just some chalk for the board. She buys the good kind, the soft Japanese chalk that glides and doesn't squeak.

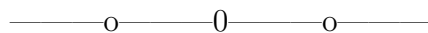
We enter the dorm on Purdue's campus, where the fifteen women in the 2016 cohort of EDGE live and work for four weeks, and Alejandra makes her way around the table. "They are working together so well." She turns to me and frowns, "I feel like they don't need me." This is mock disappointment. Alejandra is very proud that the women, pouring over Arzela-Ascoli and Sylow theorems, are not asking for her help. But they light up when they see her walk in.

There are laptops out, theorems on the chalkboard, and the conversations echo around the small room. “Can I see how you did it?” “I think I got it, I just need to rewrite it, make it nice.” Facebook is not open, no one is texting. The tone feels light and easy, no one is tense or posturing. Some people have changed into pajamas, but most have not yet returned to their rooms all day, although its 9 o’clock at night.



This scene, this table of women discussing and offering suggestions and advice, is the result of almost twenty years of hard work. The supportive atmosphere is essential to the success of the EDGE (Enhancing Diversity in Graduate Education) summer session and every year it is recreated, like manufacturing lightning in a bottle. But the recipe only works when a large group of collaborators, from program officers at funding bodies to local coordinators like Alejandra, are committed to the mission of supporting women in mathematics. The summer session is just one component of the broader EDGE program, one that includes ongoing mentoring support and summer sessions for women entering the job market post-Ph.D. Retention and advancement of women, especially those from underrepresented minority groups, has no single, simple fix.

EDGE began in 1998. The founders, Dr. Sylvia Bozeman and Dr. Rhonda Hughes, believed students whose potential may not be as obvious, due to their lack of exposure to advanced mathematics as undergraduates, can still succeed in advanced studies [2]. For many participants, especially women of color, the support system and mentoring of EDGE continues to make the leap to graduate study possible.



Fourteen years earlier, it was Alejandra and me sitting at a similar table, as participants in EDGE at Bryn Mawr, throwing out ideas and strategies for proofs and problem sets. Alejandra arrived at EDGE after her first year of graduate school, but most of the women had not yet started. That summer, just like this one, everyone worked well together, supportive but nervous about the daunting work ahead. Everyone had reason to be nervous, too.

Completion rates in mathematics graduate programs hover around 50%, and are lower for women and for students of color [7]. For Alejandra to look around at her friends and imagine half of these women not achieving their dream was unacceptable—they were determined to achieve their goals, together.



Figure 1: Our EDGE year (<https://www.edgeforwomen.org/edge-2002/>); Sarah bottom left; Alejandra second from right.

During her first year of graduate study at University of Arizona, Alejandra started the typical curriculum but soon had to make adjustments. She was struggling and eventually dropped graduate level topology and switched to a lower level. She also got a C in graduate real analysis; altogether it was a dismal start to graduate study. Her story up to then had been a success story, a story of beating the odds. She was a young mother, and she was the child of immigrant parents who had not gone past an eighth grade education. Yet she had graduated college and was determined to earn the highest degree possible, not just for herself, but for her family. This disheartening start in her graduate classes took its toll on her. What Alejandra learned the hard way was what she should have been told before she arrived- graduate school is not an extension of undergraduate studies. The leap in difficulty and expectations is a challenge for everyone, but for those without mentoring it can be disastrous. Alejandra was admitted to the EDGE summer session of 2002, after this first difficult year at graduate school, and from that point on, everything changed.



Figure 2: Our reunion in 2003, Pomona College. From left to right Alejandra (5) Sarah (9). Photo by Sarah Bryant.

Alejandra knows that her career, even her identity, has been shaped for the better by her involvement in EDGE. “These women,” she refers to the group currently gathered around their evening problem sets in a basement dorm, “they will see each other at conferences and gatherings for years to come, and will be shaped and supported by the large network of EDGE participants and mentors.”

But will EDGE continue to run? This is a special program, one of only a handful of such diversity-focused summer programs for women entering graduate programs, and no other new programs are on the horizon to fill its place should it lose funding.

In fact in recent years, many long-standing and celebrated programs—some for women, others focused on mentoring—went suddenly unfunded. The list includes the Carleton College Summer Mathematics Program for Women [1], the George Washington University Summer Program for Women in Mathematics [3], and the Nebraska IMMERSE program [6]. With some news of minor gains in retention of women in mathematics have come huge cuts to the very programs that made those gains possible. The model of academia

seems to be flipped on its head when it comes to programs: instead of great work being rewarded with a committed investment (a la tenure), successful programs are put to pasture even as the challenges they address continue. In order to see these programs and their missions supported, the mathematics world must grapple with its role in funding and continuing diversity initiatives and how it will define success for related programs.



Figure 3: Other EDGE friends at other formal and informal reunions. Photos by Sarah Bryant.

Unfortunately, there is no topic as uninteresting to certain members of the mathematics community as the very topic of “the mathematics community.” After all, it’s math. One can argue that math is about pure ideas and that bodies do not matter. And so diversity does not matter, representation does not matter. This is exactly what many heard during the Supreme Court hearing of *Fisher v. University of Texas at Austin*, when Justice John Roberts asked [5] “What unique perspective does a minority student bring to a physics class? I’m just wondering what the benefits of diversity are in that situation?”

To the founders and current directors of EDGE, representation does matter. Since EDGE began in 1998, more than two hundred women have participated, and so far there are more than sixty-five PhD recipients and many more either in the pipeline or successful in other careers in industry, education, and government. Since 2008, EDGE has operated under the leadership of Dr. Ami Radunskaya and Dr. Ulrica Wilson, two mathematicians who have expanded the EDGE program to meet the needs of women at a wider range of critical transition points.





Figure 4: EDGE directors Ulrica and Ami, then Alejandra, Alison (2002), Sarah. Ulrica will be stepping down soon as co-director as Raegan Higgins (2002) takes her place. Photo by Sarah Bryant.

In other words, today EDGE provides support beyond graduate school. Alejandra's role as one of the 2016 local program coordinators is an example of the mentoring into leadership roles that Ami and Ulrica see as increasingly important in changing the landscape of higher mathematics. Women must not just survive transition points, but thrive during them, in order to become the role models and change makers of the future. Alejandra laments, "I struggle with being in a leadership position, but I know that little girls and students of color need to see us in a visible leadership roles. Otherwise, they won't know that they can do this too."

Now that the 2016 elections are over, it feels like there is much uncertainty in the air and a sense of urgency. As Dr. Gutierrez states [4], "mathematics needs a diverse body of people so that the field can sustain itself in the most vibrant way possible." How will our diverse group of students be treated? In just a matter of weeks since the 2016 election, there is already a spike in minority students reporting harassment [8]. Will they have the mentorship and support to help them succeed? How many other programs will be cut? How will this affect the future of EDGE?



So many questions and so little certainty. I ask Alejandra what she sees for herself and for the program so instrumental to her success. “I can state with certainty,” she says, “if it wasn’t for the EDGE family, I would not be where I am today. And so I will give EDGE everything I can for as long as I can, in hopes for brighter days ahead.”

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