

## The Welcoming Side of Mathematics

In spring 2013, the IAS Women and Mathematics (IAS-WaM) program turned twenty years old. To get a sense of what the atmosphere was like around the time the program started, consider the shock waves that went through the mathematical community when a 1991 article in *Science* magazine carried a table showing the number of women faculty in the “top ten” mathematics departments in the U.S. The eight zeros in the column marked “tenured women” painted a sobering picture of the upper echelons of the field. That today none of the numbers would be a zero is due in part to the contributions of programs like IAS-WaM. That today all of those numbers remain in the single digits might make a compelling argument for the continuing need for these programs.

Held each summer at the Institute for Advanced Study in Princeton, IAS-WaM brings together women mathematics students, postdocs, and professors for two intense weeks of lectures, tutorials, panel discussions, and social activities. IAS-WaM is one of a growing constellation of programs—such as Research Experiences for Undergraduates, the AMS Mathematics Research Communities, Project NExT, etc.—that show how the mathematical community is taking an increasingly sophisticated approach to nurturing and supporting the next generation of mathematicians.

One striking aspect of IAS-WaM is the way it brings together women with diverse backgrounds, interests, and views—including some who are not at all sure that women-only programs are a good thing. Marthe Bonamy, a graduate student at the University of Montpellier in France, had always believed that such programs work against the ideal of having it not matter whether one is a man or a woman in mathematics. But when one of the IAS-WaM lecturers, Maria Chudnovsky of Columbia University, met Bonamy at a workshop and invited her to attend IAS-WaM, Bonamy immediately said yes. Once in Princeton, Bonamy found her skepticism quickly giving way to enjoyment of the mathematics and immersion in a friendly community. After nearly two weeks in the program, she found it strange to contemplate its end. She said of her fellow program participants, “I can’t believe I won’t keep seeing these people.” Some months after IAS-WaM ended, Bonamy said her views about women-only programs had changed. IAS-WaM “helped me a lot, in ways I didn’t know I needed help.”

Another participant, Anastasia Chavez, is a graduate student at the University of California at Berkeley and a mother of two. At a panel discussion about alternative careers in mathematics (full disclosure: I was a panelist), Chavez brought up “stereotype threat”, a term that denotes the effect that stereotypes can have on academic performance. Some studies of stereotype threat suggest that reminding test-takers of common stereotypes—such as the notion that women or African-American people do poorly in mathematics—can

influence their performance on the test. Chavez finds that, in her high-powered department where mathematics research dominates, few people want to discuss such issues, which she finds are on her mind as she prepares for a future that will likely involve teaching. At IAS-WaM, Chavez found the climate to be more open and receptive to such topics.

In many of the top mathematics doctoral programs, and even in some elite bachelor’s programs, women are still fairly isolated. Often there is an expectation that it’s supposed to be all about the mathematics and that anyone needing anything more, like camaraderie and moral support, is weak and lacking ability. There’s a lot of pretending to know and hiding of ignorance. One participant observed that in her department all the graduate students seemed to be “masochistically pushing through”. IAS-WaM provides a welcome respite from such hyper-competitive milieux. “Part of the idea of this program is to get people to enjoy doing mathematics and feel successful at doing it,” said Dusa McDuff of Barnard College, one of the IAS-WaM organizers. “They work together and find ways to tackle problems in an area they don’t know very well and to approach it with an open mind. They also get to see how other people think about mathematics, because the discussion is quite open in the tutorial sessions. And there are no consequences. There is no exam. It’s not as though [the participants] are all going to be judged... This relieves stress.”

Of course, making a career in mathematics is difficult and stressful for nearly everyone. Nancy Hingston of the College of New Jersey, who has been on the IAS-WaM program committee for several years, noted that many women entering the field today take a very pragmatic approach to negotiating the hurdles. “There is no hand-wringing,” she observed. “It’s just: Okay, tell me what I need to do to get this job, or succeed in graduate school, or whatever it is.” Indeed, the main concern for many women in mathematics today is how to juggle career and family. This is a substantial problem, but it’s a logistical one. The problem of breaking into what’s considered to be a “man’s field” is far more difficult—and seems increasingly to be receding into the past.

During a panel discussion on succeeding in graduate school, several women mathematicians described their own experiences. There was drama, surprise, and plenty of laughter. There was also the sense that, while one needs toughness and persistence to make it in mathematics, the field welcomes all kinds of people. Stick with it, and be open to the opportunities that come along, Shabnam Beheshti of Rutgers University told the participants. “There is a place in this world for all of us... It may not be the box you think you fit into. But it’s there.” By uniting a wide variety of women around their interest in mathematics, IAS-WaM showcases the open, welcoming side of mathematics.

—Allyn Jackson  
Senior Writer and  
Deputy Editor of the Notices  
axj@ams.org