Teaching Statement

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Teaching has been important to me since long before I became a mathematician. While my first formal classroom teaching was during graduate school, ever since I started learning facts, I've wanted to share them with other people (if my mother is to believed). As I learn more and more beautiful mathematics, the more important it seems to help other people see that beauty. While teaching, just like research, has its own frustrations, all math, whether it be calculus or cutting-edge research, loses its meaning if it is not shared.

As an undergraduate, I chose to go to a smaller liberal arts college, focused on teaching, and I have never regreted this decision. I've both personally experienced, and seen in my friends, the difference that good teaching and engaged instructors can make to the undergraduate experience. I hope to be able do my own small part to replicate this at a larger university like MIT.

Of course, my most important teaching experience thus far has been as a graduate student instructor at Berkeley. Each semester I was a GSI, I spent a total of 6 hours of week in the classroom with two sections of around 25 students each as a complement to an equal amount of lecture with a professor, as well as 2 hours a week of office hours. I wrote and graded weekly quizes, and graded selected homework problems and exams.

The class time was a mixture of group work and going over problems from the book, worksheets or previous homeworks as a class, depending on the material, the facilities (some classes had enough blackboard space for group work at blackboards, some didn't) and the disposition of the class (independent group work just doesn't go as well at 8 a.m. as it does at 11 a.m.). Whatever the format, I made my first priority to have an interactive class. After all, the students had plenty of lecture to passively listen to the material of the course; in section, I wanted them to use the concepts of the course themselves, with me being there just to keep things on track. It takes them a little while, but the students start participating when they figure out that really I'm not going to

tell them they the next step without any input from the class. This was particularly effective once I had learned all the students' names and could ask individuals for the next step in a problem.

I also have a lot of experience with activities I consider to be teaching outside the clasroom. After all, calculus students are an important audience for mathematics, but they're far from the only one. As an undergraduate, I worked as a tutor for other students not just in math, but also physics, writing and Spanish through the tutoring center at my alma mater. I've given many talks, ranging from speaking on my own research at conferences to informal expository talks in student-run seminars. For a year, I both co-organized and spoke in a weekly seminar for graduate student speakers called "Many Cheerful Facts" which was focused on talks accessible to first-year graduate students. This fall, I'm visiting the Center for Topology of Moduli Spaces in Århus, Denmark, and have been tutoring younger graduate students there in connection with a course on the quantization of moduli spaces.

In all of these contexts, I've found that the most important thing is trying to see your topic through the eyes of your audience, whether that means pitching a talk differently to representation theorists than to topologists or trying to see the world of math through the confused eyes of a calculus student. Throughout, one has to strike a balance between seeing the next rung on the ladder of understanding your audience can reach, and accepting and working around their limitations. When they needed it, I've worked very hard to teach calculus students induction and succeeded with much of my class, but have learned the hard way that most of them will never be able to derive trigonometric identities on the fly.

While MIT provides an exceptional research environment, I also see it as an opportunity to work with some of the brightest students, both graduate and undergraduate, in the world. That is an opportunity I greatly look forward to as well.