Carlos Castillo-Garsow
Statement of Interest
Advanced Study Institute

I first studied mathematical epidemiology at the Mathematical and Theoretical Biology Institute (MTBI) at Cornell University, in 1996. MTBI was my inspiration to continue my studies in mathematics, and epidemiological thinking is still a core part of my approach to a broad number of subjects.

What MTBI taught me was the value of mathematical research and a research mindset. The idea that a person can work on a problem without knowing the solution or knowing how to get there was critical, as well as the idea that hey, all this math stuff I learned in high school really was useful for something. That it could make a societal impact. At the same time, I began to learn to appreciate mathematics in the way that mathematicians do. I learned to value challenging problems, elegant, generalizable solutions. I also learned how to learn and use and think in calculus, rather than just doing calculus.

I returned to MTBI for several more summer programs, first as an advanced student, and later as a teaching assistant. In the course of my time at MTBI I co-authored 3 technical reports, and supervised another four. During the rest of the year, I studied Biometry and Statistics as an undergraduate at Cornell University, a choice I made specifically because of the depth of impact that the MTBI program made on me.

And I desire to pass on those lessons to other people. I want to teach people to appreciate mathematics, to think mathematically, and to value mathematical thought. I believe that mathematical biology, with its explicit applications, is one of the best ways to do that.

Currently, I am a Ph.D. student in Mathematics at ASU, specializing in mathematics education. As part of my work, I am collaborating with Prof. Carlos Castillo-Chavez to create a book in mathematical biology targeted towards high school teachers. The book will be used in conjunction with a course that teaches mathematical biology to high school teachers and encourages them to use mathematical biology and applied mathematical thinking in their own classrooms. For me, this is the perfect way to pass on the life changing experiences I had at MTBI.

One of the things that is missing in the design of most courses is a long term view. in order to teach mathematical principles, it is necessary to have an understanding of how those principles develop in more advanced mathematics. Failure to have this understanding creates teaching that, even if it is technically correct, nonetheless generates misconceptions in the students. While Prof. Castillo-Chavez is on the cutting edge of his field, and will not make such mistakes in design, I am not. I feel that a greater understanding of mathematical biology, as well as advanced topics in the field, are necessary to insure the quality of my work on this book.