

VIGRE Funding Report

(due 30 days after semester of support)

Semester/Summer and Year:

SPRING/SUM 09

Name: MICHELE REILLY

List the graduate courses you have taken this semester (including independent studies), your grades, and the instructors:

Course	Title	Grade	Instructor
534 B	TOPOLOGY/GEOMETRY	A	DR. PICKERELL
529	RESEARCH TUTORIAL GROUP	A	
511 B	ALGEBRA	B	DR. JOSHI
523 B	ANALYSIS	C	DR. WEBER

List the title, date and location of any talks you have given, either here or elsewhere: N/A

If you are working on your dissertation, include a one paragraph description of your research progress. If you have not yet begun dissertation research, describe your progress toward finding a dissertation topic and advisor and beginning that research.

(PLEASE SEE ATTACHED).

List publications, if any. *N/A*

Check all activities you completed during the funded period:

Academics:

- Independent Study
- Oral Comprehensive Exam
- Commence Thesis Research
- Conference attendance
- Conference participation
- Complete PhD

Professional development and outreach:

- AP Calculus Visit
- High School Workshops
- Undergraduate Research Project
- Undergraduate Research Seminar
- Super TA
- Mentoring junior graduate students for the qualifying exams
- RTG (help organize)
- Research Seminar (help organize)

Other (please specify)

Attach a brief statement about your academic progress and professional development during the period of support.

Michele Reilly - VIGRE

During this period of VIGRE support I have concentrated on preparing for the qualifying examinations. This summer, I am planning on taking all three qualifying examinations. I also completed coursework in Math 511A,B; Math 523 B; Math 534A,B and a reading course in the fall 2008.

My research interests are in areas of Geometric Analysis and Differential Geometry. In the Fall, I will begin working with Dr. Leonid Friedlander on the RTG project . We have briefly discussed the 'fundamental gap conjecture' for a convex domain in \mathbb{R}^n . It is the problem of finding a sharp lower bound to the gap between the first two eigenvalues of a Schrodinger operator on a bounded convex domain. After the first eigenvalue, this object (difference between the first and second eigenvalue of the laplacian) is a natural object to study given physical motivations. It is expected that the fundamental gap conjecture holds for all triangular domains in \mathbb{R}^2 . After the examinations in August, I will begin reading a recent paper by Lu and Rowlett to continue to study this problem in detail.