

VIGRE Funding Report

(due 30 days after semester of support)

Semester/Summer and Year:

Summer 2008

Name: Victor I. Piercey

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

Course	Title	Grade	Instructor

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

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.

This summer I worked with Yi Hu in preparation for my comprehensive exam. I read portions of several algebraic geometry texts, worked some problems, and worked on my project about resolution of singularities in triangle spaces (this will become the topic for my written comprehensive exams).

List publications, if any.

Check all activities you completed during the funded period:

Academics:

Professional development and outreach:

Independent Study

AP Calculus Visit

Oral Comprehensive Exam

High School Workshops

Commence Thesis Research

Undergraduate Research Project

Conference attendance

Undergraduate Research Seminar

Conference participation

Super TA

Complete PhD

Mentoring junior graduate students for the qualifying exams

RTG (help organize)

Research Seminar (help organize)

Other (please specify)

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

VIGRE Funding Report, Summer 2008, Part II

Academic Progress and Professional Development

1 Research and Academic Progress

Thus summer, I studied an article by J.G. Semple on triangle spaces as well as read texts on algebraic geometry. Semple's article characterizes spaces of triangles in \mathbb{P}^2 and resolves a singularity that occurs when all the points and lines in the triangles come together. I worked through all the necessary computations to understand the argument, and proceeded to try some calculations for the space of quadrilaterals in \mathbb{P}^2 . The latter quickly became unmanageable, and Dr. Hu and I decided to try a more conceptual approach involving tangent spaces and blowups. The goal is for me to write a paper reproving Semple's results using these more conceptual tools. If this can be done, we can try to tackle the quadrilateral case using such an approach, and this may ultimately become part of my thesis research. As a consequence of this change in direction, I spent the remainder of the summer studying blowups.

In addition, I worked through portions of several algebraic geometry texts. Specifically, I studied Harris' *Algebraic Geometry*, Shafarevich's *Basic Algebraic Geometry Part I*, some of Hartshorne's *Algebraic Geometry*, and course notes published online by Andreas Gathmann. These texts will help me form the necessary background to do research in algebraic geometry.

Finally, I concluded my summer by completing and passing the Russian language exam.

2 Professional Development

This summer I also helped the first years prepare for the qualifying exam in topology and geometry. We spent the first couple weeks going over past qualifying exams. During the remainder of the summer, I prepared problems for each session that the students would work on, with presentation of solutions at the end of the session. I think this format was quite successful. Only two people failed the topology and geometry qualifying exam (and one of those two did not participate in the summer problem sessions). This is a much lower rate than the previous two exams administered in the fall.