

DEPARTMENT OF MATHEMATICS

VIGRE Funding Report

(due 30 days after semester of support)

Semester/Summer and Year:

Fall 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 |
|-----------|------------------------------------|-------|------------------|
| MATH 519 | Topics in Number Theory | A | David Savitt |
| MATH 536A | Algebraic Geometry | A | Doug Ulmer |
| MATH 599 | Independent Study | S | Yi Hu |
| PHYS 569 | Introduction to General Relativity | A | Dmitrios Psaltis |
| | | | |

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

Sheaves and Schemes, University of Arizona Graduate Colloquium, October 8 2008.

Parameter Spaces of n Points in General Position in P^2 , University of Arizona Algebra and Number Theory Seminar, November 18 2008.Parameter Spaces of n Points in General Position in P^2 , University of Arizona Geometry Seminar, November 25 2008.

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.

Preparation for oral comprehensive exams with Yi Hu.

List publications, if any.

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

VIGRE Funding Report, Fall 2008, Part II

Academic Progress and Professional Development

1 Research and Academic Progress

This semester, I completed the first part of the algebraic geometry course and read portions of texts on algebraic geometry assigned by Yi Hu for my independent study. 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. Dr. Hu had me work through material relating to blowups, tangent spaces, singular and non-singular points, Grassmanian varieties, and tangent spaces to varieties associated to the Grassmanian.

The goal is to prepare for the comprehensive exam. The algebraic geometry course (which I will continue in Spring 2009) will help me learn the necessary background to do research. The texts assigned by Yi Hu were chosen to help me solve a problem that will form the written portion of the comprehensive exam. I originally planned to take the comprehensive exam by the end of the Fall 2008 Semester, but due to the amount of background material I needed to learn this was not possible. I now hope to complete the comprehensive exam during the Spring 2009 Semester.

In addition to the algebraic geometry texts, Professor Hu had me look at several articles related to the problem I am going to attempt. Some of these articles show how my problem and its generalization can be applied in other areas of algebraic geometry. Other articles deal with problems similar to the one I am working on.

2 Professional Development

I engaged in three activities that I would consider professional development. First I was a Super-TA for the geometry course. I had high attendance at the problem session, which indicates that the students are finding it useful. Second, I delivered talks on my comprehensive exam problem in the Algebra and Number Theory seminar as well as the Geometry Seminar. The talks went well and I was given some additional insight afterwards by some faculty. Finally, I attended my first algebraic geometry conference. I learned in this conference just how much I still need to learn. I was also able to meet some people who work in the field and begin networking.