

DEPARTMENT OF MATHEMATICS

**VIGRE Funding Report****(due 30 days after semester of support)**

Semester/Summer and Year:

Spring 2009

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 536B	Algebraic Geometry	A	Doug Ulmer
Math 538	Topics in Geometry and Topology	A	David Glickenstein
Math 599	Independent Study	S	Yi Hu
Fren 500	French for Reading	A	Elizabeth Zegura

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

The Parameter Space of Tetrahedra in  $P^3$ ; May 8, 2009; University of Arizona (Oral Comprehensive Exam Presentation)

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.

I passed my comprehensive exam and I am beginning thesis research with Dr. Yi Hu this summer.

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)

I completed the Communication Skills Requirement.

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

## VIGRE Funding Report, Spring 2009, Part II

### Academic Progress and Professional Development

## 1 Research and Academic Progress

This semester, I completed my comprehensive exam and have satisfied nearly all thesis-related requirements. I will begin thesis research this summer.

The original plan for my comprehensive exam was for me to do some original work. I was going to find a nonsingular compactification of the parameter space of four points in general position in  $\mathbb{P}^2$ . In order to gain insight into the problem, Dr. Hu instructed me to read two articles on a related problem - identifying and studying the parameter space of four points in general position in  $\mathbb{P}^3$ . I was taking a considerable amount of time to read these articles, so we decided that they would make a good topic for my comprehensive exam. I passed my comprehensive exam on May 8, 2009. Thanks to my work with these articles, I have several ideas as to how to proceed in my original problem. Some of these ideas may generalize to  $n$  points in general position in  $\mathbb{P}^2$  and help form the basis of a thesis.

In addition, I have completed all non-thesis requirements with one exception. I still have to take one more course outside of the department. I was enrolled in a physics course this semester that would have satisfied this requirement. However, once homework began to be assigned (about three weeks into the semester) I realized that the workload in the course was an obstacle to completing my comprehensive exam. I dropped the course in favor of the latter, and I am very thankful I did so. I plan on satisfying this requirement next year.

## 2 Professional Development

I engaged in three activities that I would consider professional development. First I was a Super-TA for the geometry course. Attendance was fairly high (relative to the size of the course) when there was homework. On the "off-weeks" there were a couple of students who still showed up and we would discuss topics related to the material being covered in the course. For example, during one week when there was not any homework, I was asked about the degree of maps between spheres. I discussed this in some detail, going over (and in some cases proving) several properties, culminating in Brouwer's original proof of his fixed point theorem. In addition to running the problem sessions and holding office hours, I was given an opportunity to lecture during one of the classes.

The second professional development activity I participated in was a high-school visit. I visited St. Gregory College Preparatory School with Doug Pickrell and an undergraduate student. The experience opened my eyes to outreach activities. Partly as a consequence of this visit, I decided to apply for (and subsequently received) a NSF GK-12 fellowship for next year. Under this program, I will be working with a math teacher in Casa Grande Union High School during the 2009-2010 academic year.

Finally, I attended an algebraic geometry conference. This was the Spring 2009 incarnation of the Western Algebraic Geometry Seminar, the same series I attended in the Fall 2008 semester. At this conference I was pleased that I understood a little more than I did at the fall conference.