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Mathematics Ph.D.

I have been engaged in several activities during the academic year 2001-2002, and I was supported by the VIGRE grant during both the fall and spring semesters. I have engaged in two major and several minor activities during this academic year. During the small semester and the first two months of the spring semester, I prepared for my oral examination on Faltings' proof of the Shafarevich conjecture on the finiteness of the number of isomorphism classes of certain abelian varieties. The thrust of this effort involved the ingestion and consolidation of the required material from the various fields, especially number theory and algebraic geometry. The written portion of the examination, amounting to approximately 170 pages, was intended to provide a sketch of this required material and to be accessible to graduate students after a course in number theory and algebraic geometry. I am happy to say that I passed the oral examination through assistance of Dr. Ulmer. Moreover, due to the scope of this project I am certain that I would not have been able to complete the examination at the time I did with VIGRE support.

Shortly after completion of the exam, with VIGRE support providing for no teaching responsibilities, I was able to participate in a six week Graduate Student Workshop at the Centre de Recherches Mathématiques in Montreal on the Langlands Program for Function Fields. Of the numerous topics of this workshop those that combined a differential geometric and number theoretic perspective excited me the most and I made further study into these areas beyond what was covered in the lecture series. During the workshop, I resolved to look for a Thesis topic combining Poisson geometry in an algebraic context and number theory.

During the spring semester of VIGRE support, I participated in, by presenting a proof of the Weil Conjectures for curves, a seminar run by Dr. Joshi in preparation for the Arizona Winter School. I also attended the Arizona Winter School on Periods before leaving for Montreal. During the fall semester, I gave a talk to high school students on linear encryption techniques for a workshop organized by Jenn Smith. Also during the fall semester, I was the organizer for the Graduate Student Colloquium and gave a talk for the Colloquium entitled "Viewing Sets through Category Theory" which presented some of the ideas behind Topos theory. Although I was no longer organizer for the colloquium in the spring semester, I did give a talk entitled "Hopf Algebras" which, in addition to the material suggested by the title, tried to illustrate the categorical viewpoint of Hopf Algebras.

In terms of course work, during the Spring and Fall semester I attended Dr. Lux's course on Homological Algebra and during the Fall semester I attended Dr. Lu's course on Symplectic and Poisson Geometry. I also engaged in independent studies with Dr. Ulmer, in preparation for the Oral examination, and with Dr. Joshi on Algebraic geometry.