

DEPARTMENT OF MATHEMATICS

# VIGRE Funding Report

(due 30 days after semester of support)

Semester/Summer and Year: DB

Fall 2007

Name:

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

Course	Title	Grade	Instructor
MATH920	Dissertation Units	K	J Watkins

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

Student Brown Bag Seminar, Advanced Sudoku Methods, 11/16/2007

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.

Finalized theoretical developments for monotone process theory of interaction map particle systems. Compiled computer code for mean field analysis and forward or reverse(CFTP) coupling of the process.

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)

Dissertation Research

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

Joseph Stover  
1/11/2008

### VIGRE Report, Academic Progress and Professional Development

While I was not able to take part in as much outreach as I would have liked, academic progress was substantial. I made several high school visits to City High and participated in two high school workshops at the university. I hope to continue academic outreach throughout my career. So these opportunities have undoubtedly helped develop my capabilities in this area.

Going through the whole process of applying for jobs was also an intense learning experience. I have applied to almost every state and several foreign countries.

My dissertation work was extremely focused during this semester. I finally achieved the result that I have desired for probably two years. It has been a goal of mine from the beginning to generalize the Universal Coupling to a larger class of interacting particle systems and to understand what exactly monotonicity means in these cases. For me personally this is the crux of my graduate career, mostly due to the amount of time I spent toiling over these concepts. So it is a great achievement to finally understand it fully. This theoretical result is important since it applies to such a wide range of models. The framework of my dissertation is complete along with several theoretical and numerical results. All that remains is to finish writing it up. I will be defending at the end of this semester.