VIGRE REPORT PART II · SPRING 2010

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The period of support (spring 2010) completed the fifth and final year of my PhD program in mathematics at the University of Arizona. My activities were as follows.

Principally, I completed my doctoral research. With all high-performance computing runs complete, I updated, with smaller error bars, experimental determination of critical temperature T_c as a function of α. This had been more crudely computed near the end of the fall semester. I then used the estimated critical exponents for $\mathbb{E}[\ell_{\max}]/N$ and f_I to test the hypothesis that the GRU quotient $\mathbb{E}[\ell_{\max}]/Nf_I$ is constant in T for $T < T_c$. (Off-lattice computations, as well as use of non-Ewens cycle weights, are a postdoctoral research topic.) I finished several chapters of my dissertation which had been incomplete. I defended my dissertation March 22, and completed revisions on April 10.

I submitted a condensed version of my dissertation to the Journal of Statistical Physics in December, in time for job applications. In early March, the paper was accepted with revisions. I submitted those revisions after my defense; the paper is now in publication.

I recently spoke with Jan Wehr about publishing percolation results described in my summer/fall 2009 proposal. I intend to finish this work this summer; I did not complete this task in time for the end of VIGRE support.

I continued to work with Tom Kennedy's bridge group. My contributions were (in my opinion) quite small. (1) I did some ad hoc software mentoring with various members of the group. (2) I wrote a few shell scripts which enabled Tom Kennedy's SAW-pivot code (as customized by members of the group) to run in the background on a compute server. (3) I wrote a program to exhaustively count, using a backtracking algorithm, location-constrainted self-avoiding walks of length N in the plane, for N up to 20 or so. This was intended to complement Tom's software which examined location-constratined self-avoiding walks of much longer lengths, using sampling methods. I found that the achievable walk lengths were too small to confirm Tom's results.

Along with Tom Kennedy, I co-organized the weekly mathematical physics seminar.

I gave a talk on my dissertation research at the AMS/MAA Joint Meetings in San Francisco in January. Of course, my primary purpose for attending this year's meetings was the job search; I had three interviews there, two of which led to offers of on-site interviews.

I also attended the 23rd Annual Workshop on Recent Developments in Computer Simulation Studies in Condensed Matter Physics at the end of February at the University of Georgia. I gave a contributed talk on the worm-algorithm portion of my dissertation. I made several professional contacts. As well, I obtained advice on the worm algorithm's stopping-time problem — alas, too late to implement for my dissertation research.

Spring job-seeking efforts included attendance at the Joint Meetings, several on-site interviews, and one job offer, which I accepted. Academic employers were not interested in me; one acknowledges that it is a tight job market this year. A mathematical-consulting defense contractor, who recruited me at the Joint Meetings, as well as three financial firms I applied to, brought me on-site for interviews. One of the latter made me

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an offer, which I accepted. I will be working as a quantitative software developer in New York, starting in mid-June.

VIGRE support was particularly helpful in permitting me to focus on the job search. I extend my appreciation to the VIGRE committee.