

Report of the visit to Groningen

April 25–29, 2005

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During this visit I discussed, with Prof. Aernout van Enter, the following issues:

1. Partially ordered models. In these processes, which generalize cellular automata, the state at each point is determined by that of sites on a “past” defined through a partial order. A student of mine has obtained some preliminary result, including a “Gibbs-like” theory of extremality and mixing, and the analogous of Dobrushin and disagreement percolation uniqueness criteria. We discussed the possibility of phase transitions for short-range models, and its relation with the “positive-rates” conjecture.
2. Quantum statistical models. I briefly exposed the results of a collaboration with Profs. Froehlich and Ueltschi on the low-temperature phase diagram of the Bose-Hubbard model. We then discussed the definition of KMS states and the possibility of showing that, at high temperatures, a renormalized KMS state remained a KMS state. This would correspond to the quantum analogue of a result by Griffiths and Pierce for classical Gibbs states.
3. Gibbs states on random graphs. Together with Prof. Krystof Kulske, we discussed Gibbs models on random trees and the need of a uniqueness criterium in the almost-sure sense. I exposed the main lines of a paper by Dobrushin and Kasalygo containing a similar criterium for models with random interactions on a fixed graph. We are considering its adaptation for the case where the randomness comes from the graph.
4. Non-Gibbsianness on evolutions. We discussed strategies to attack the problem of long-term non-Gibbsianness of states obtained by the Kawasaki evolution of low-temperature Gibbs states. Similar results have been obtained, in collaboration with den Hollander and Redig, for non-conservative Metropolis evolutions.

In addition, on Friday 28 I travelled to Utrecht, where I assisted to the Kac seminar and discussed with Prof. den Hollander a number of issues related to RDSES. I am particularly interested to set up a program “Erasmus Mundus” among members of the network.