Special Topics Course Announcement, Spring, 2006
Statistics 593C (3cr): Non-standard asymptotics and particle systems
Instructor: Piet Groeneboom
Time: 10:00 - 11:20 Tuesdays and Thursdays
Place: Padelford C-301

Description of the topic of the course:
Many nonparametric estimators which arise as solutions of optimization problems
(maximum likelihood, least squares, etc.) have non-normal limit distributions, and converge
at rates slower than $n^{-1/2}$. This type of limit behavior is commonly called “non-standard
asymptotics”, and the local limit often has a characterization in terms a stationary point
process. The latter was shown, for example, in [3] for the Grenander estimator of a decreasing
density. Results of this type have counterparts in the theory of interacting particle systems
on the integers, such as TASEP (totally asymmetric simple exclusion processes) and in the
theory of interacting particle systems on the real line, such as Hammersley’s process. The
connection between these seemingly unrelated fields is discussed in [2] for Hammersley’s
process, with a follow-up for TASEP in [1]. It is my intention to discuss recent results on
these matters and to explore the rather fascinating connection between the fields further
during the course. I will also discuss the (many) open problems.


A selection of further papers, relevant for the topic of the course:

longest increasing subsequences. Probab. Th. Relat. Fields, 103, 199-213.

longest increasing subsequences of random permutations. J. Amer. Math. Soc. 12,
1119-1178.


