SERIES OF SEMINARS

Wednesday	**7 July**	**10:00 - 11:30**
Thursday	**8 July**	**10:00 - 11:30**
Wednesday	**11 August**	**10:00 - 11:30**
Wednesday	**18 August**	**10:00 - 11:30**

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DISCUSSION ROOM 303
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ABSTRACT

We survey a number of models from physics, statistical mechanics, probability theory and combinatorics which are each described in terms of an orthogonal polynomial ensemble. The most prominent example is apparently the Hermite ensemble, the eigenvalue distribution of the Gaussian Unitary Ensemble.
In recent years a number of further interesting models were found to lead to orthogonal polynomial ensembles, among which the corner growth model, the PNG droplet, non-colliding random processes, the length of the longest increasing subsequence of a random permutation, and others.
Much attention has been paid to universal classes of asymptotic behaviour of these models in the limit of large particle numbers, in particular, the spacings between the particles and the fluctutation behaviour of the largest particle. Computer simulations suggest that the connections go even further and also comprise the zeros of the Riemann zeta function. The existing proofs require substantial technical machinery and heavy tools from various parts of mathematics, in particular, complex analysis, combinatorics and variational analysis.
We survey various models, explain the questions and problems, and make remarks on the relations between the models. Furthermore, we concisely outline some elements of the proofs of some of the most important results.
These talks are aimed at the non-expert who wants to achieve a quick survey over the field.

1st Talk: Random matrix theory I
2nd Talk: Random matrix theory II
3rd Talk: Random growth models
4th Talk: Non-colliding random processes

The four talks can be enjoyed independently of each other.

All are welcome. **1 July 2004**