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Invitation to Seminar Talk

An algebraic approach to some models in the KPZ "Universality class"

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The goal of this talk is to make the audience familiar with certain algebraic and combinatorial methods which prove useful in the study of the models in the "KPZ Universality class". Not only they prove useful, but some of the models can be seen to arise from purely combinatorial objects. An example for such a model is the Last Passage Percolation, which is known to be in the "KPZ Universality Class". It turns out that the LPP can be constructed via the Viennot's geometric construction of the Robinson-Schensted correspondence, which gives a bijection between the elements of the symmetric group (the group of permutations of the set {1,2,...,n} and the set of pairs of standard Young diagrams with n boxes. Many other surprising and fascinating connections appear in the study of those models.

Those observations (and not only) led to a conjecture that all those models should belong to one "Universality Class". This conjectural class is named after the KPZ stochastic partial differential equation, because the conjecture is that this equation will describe the fluctuations of all the models in the class. A brief but detailed overview will be provided for the basic properties of the ring of Symmetric functions over the field of complex numbers, and for the combinatorics of the Young diagrams. Once the basic definitions and properties are introduced, we shall give examples of different probabilistic models that either arise from or are related to those objects, and that belong to the KPZ Universality Class. The distributions of some of those models will be explicitly given, along with some comments on them.

The final goal of the talk is to point out how the introduced algebraic and combinatorial methods can be used in the computation of the distributions of some models in the KPZ Universality Class and, most of all to use them in order to give a taste of the deep connections between some a priori very different models.

Thursday, 18 December 2014, 3:00pm

Mondi2, Central Building, 1st floor

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This invitation is valid as a ticket for the IST Shuttle from and to Heiligenstadt Station.
Please find a schedule of the IST Shuttle on our webpage (note that the IST Shuttle times are highlighted in dark green):
http://ist.ac.at/fileadmin/user_upload/pdfs/IST_shuttle_bus.pdf
The IST Shuttle bus is marked IST Shuttle and has the Institute Logo printed on the side.