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Talk: Supersymmetric XYZ correlations and Painlevé VI

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The XYZ spin chain describes a chain of spin $1/2$ quantum particles with a general anisotropic interaction between neighbors. When the anisotropy parameters satisfy $J_x J_y + J_x J_z + J_y J_z = 0$, the chain has an underlying supersymmetry. It is then possible to obtain exact results even for finite size systems. In the special case of the XXZ chain, this is related to very interesting combinatorics (e.g. the alternating-sign-matrix and Razumov-Stroganov ex-conjectures). There are also intriguing relations to Painlevé type differential equations. In this talk we will describe how nearest neighbor correlations for finite length supersymmetric XYZ spin chains can be computed explicitly in terms of tau functions of Painlevé VI. This is joint work with Christian Hagendorf (Louvain-la-Neuve).

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