Friday, March 28th (at 4.00pm, UK time)

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Title: Classical facets of quantum integrability.

ABSTRACT

In the talk, we present a review of the works devoted to understanding and reinterpretation of the theory of quantum integrable models solvable by Bethe ansatz in terms of the theory of purely classical soliton equations.

Our main examples are the generalized inhomogeneous spins chains with twisted boundary conditions on the quantum side and of nonlinear differential-difference equations on the classical side. From the quantum side, we restrict ourselves to quantum spin chains with rational GL(n)-invariant R-matrices (models of the XXX type). Remarkably, studying polynomial solutions of the modified Kadomtsev-Petviashvili hierarchy by methods of the classical soliton theory, one is able to develop a method of solving the spectral problem for the quantum models which provides an alternative to the Bethe ansatz technique.

Also, the connection of the quantum spin chains with classical soliton equations implies a close interrelation between the spectral problem for the spin chains and integrable many-body systems of classical mechanics such as Calogero-Moser and Ruijsenaars-Scheider models, which is known as the quantum-classical duality.
