

Talk
April 2, 09:50 – 10:40

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Monodromy-free potentials and Calogero-Moser spaces

A rational function is called monodromy-free potential if it is the potential of a one-dimensional Schrödinger equation whose solutions are meromorphic for all values of the spectral parameter. Monodromy-free potentials appear in the description of equilibrium points of Calogero-Moser systems, rational solutions of the Korteweg-de Vries equations and more recently in the IM/ODE correspondence. In the case of potentials with quadratic growth at infinity it was shown by Oblomkov that monodromy-free potentials are enumerated by partitions via the Wronskian map for Hermite polynomials. We show that they can also be identified with fixed points of a circle action on the Calogero-Moser space. As a corollary, we solve the inverse problem for the Wronskian map by showing that the set of contents of the partition is the spectrum of Moser's matrix evaluated at the poles of the potential. We also prove a conjecture by Conti and Masoero by computing the weights of the circle action at the fixed points.

In this talk I will review the classical results on the relation between monodromy-free potentials and Calogero-Moser systems, then explain the new results.

The talk is based on joint work with Alexander Veselov, with inputs of Nikita Nekrasov.