

Title: An irregular Deligne-Simpson problem and Cherednik algebras

Abstract: The Deligne-Simpson problem asks for a criterion of the existence of connections on an algebraic curve with prescribed singularities at punctures. We give a solution to a generalization of this problem to G -connections on \mathbb{P}^1 with a regular singularity and an irregular singularity (satisfying a condition called isoclinic). Here G can be any complex reductive group. Perhaps surprisingly, the solution is expressed in terms of rational Cherednik algebras. This is joint work with Konstantin Jakob, and the proof uses recent joint work with Bezrukavnikov, Boixeda Alvarez and McBreen.