

Symplectic reflection algebras

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Symplectic reflection algebras are related to a large number of areas of mathematics, such as combinatorics, integrable systems, D-modules, algebraic geometry, quiver varieties, symplectic resolutions of singularities and representation theory. In these lectures we will try to present some basic notions and results on this vast topic; we will see how the study of symplectic reflection algebras allows us to determine the existence of symplectic resolutions. We will then focus on a particular class of symplectic reflection algebras, the rational Cherednik algebras; we will explore their representation theory and its connections with the representation theory of Hecke algebras.