Quantum groups, braid groups, and monodromy

Andrea Appel
(University of Edinburgh)

It is a widely accepted principle that quantum objects are natural receptacles for the monodromy of differential (or difference) equations, enriching them with an unexpected *analytic* flavour. This feature, often mediated through (generalised) braid groups, codifies deep and essential structures appearing in many branches of mathematics, from representation theory and enumerative geometry to combintorics and knot theory. In the case of quantized Kac–Moody algebras, this principle is the corner stone of the Drinfeld–Kohno theorem, which relates the universal R–matrix of the quantum group with the monodromy of the Knizhnik–Zamoldchikov equations. In this talk, I will further extend this result, providing a description of the quantum Weyl group in terms of the monodromy of the Casimir equations. This is based on joint works with V. Toledano Laredo.