

Decorated character varieties, Painlevé equations and quantization

Abstract

In this lecture course I will introduce some notions in (quantum)Teichmuller theory for orientable non compact Riemann surfaces. We will then discuss colliding boundary components and discuss the Painlevé equations as an example. Finally we will link with the theory of Cherednik algebra.

Tentative schedule:

Lecture 1: Teichmuller theory for orientable non compact Riemann surfaces: Thurston shear coordinates, Fock decomposition, Goldman bracket and quantisation. Complexification and SL_2 -character varieties.

Lecture 2: Colliding holes in orientable non compact Riemann surfaces. Bordered cusps, Teichmuller theory for Riemann surfaces with bordered cusps. Example: confluence of the Painlevé equations as hole collision. Quantisation.

Lecture 3: Cherednik algebra associated to the root system C_1 . Basic representation. Spherical sub-algebra and Askey–Wilson algebra. Askey–Wilson polynomials and q-Askey scheme.

Lecture 4. C_1 Cherednik algebra and sixth Painlevé equation. Confluence of the Painlevé equation as Whittaker degeneration of the C_1 Cherednik algebra. Open problems.

Presenter: MAZZOCCO, Marta (University of Loughborough, UK)