Lecture on the analytic theory of differential equation

Symmetry of the Darboux equation

2014 - 07 - 25 (Fri.)
14:00 - 15:30
308, Mathematics Research Center Building (ori. New Math. Bldg.)

The Darboux equation (1882) was a generalizations of both Picard's and Hermite's equations. All these equations are generalizations of the well-known Lamé equation (1837). The equation was rediscovered by Treibich and Verdier in the 1980s concerning it having finite-gap property in an algebraic geometric characterization. The equation is a (doubly periodic) torus version of the Heun equation which lives on the Riemann sphere. It turns out that the Darboux equation has a better symmetry structure compared to that of the Heun equation. In this talk, we will describe the symmetry of the Darboux equation via the study the transformations which induce the automorphisms of the Darboux equation. We show how to apply the automorphisms to generate the 192 local solutions of the Darboux equation. This is a joint work with Chiu-Yin Tsang and Avery Ching.