Speaker: Chaya Norton
Concordia University

Thursday, November 16, 2017
2:00 PM
258 Hurley Hall

Title: Symplectic Geometry of the moduli space of Projective Structures on Riemann surfaces

Abstract:

The moduli space of quadratic differentials on Riemann surfaces can be viewed as the total space of the cotangent bundle to the moduli space of Riemann surfaces. By choosing a base projective connection which varies homomorphically in moduli, the moduli space of projective structures is identified with the moduli space of quadratic differentials. A projective connection defines, via the monodromy map, a representation of the fundamental group of the Riemann surface into $PSL(2, \mathbb{C})$, i.e. a point in the character variety. We study the symplectic geometry induced via these maps and show: The homological symplectic structure on the moduli space of quadratic differentials (defined explicitly in terms of Darboux coordinates which involve the double cover arising from a quadratic differential) is identified with the canonical symplectic structure on the cotangent bundle to the moduli space of Riemann surfaces. Choosing the base projective connection as Bergman, Schottky, and Wirtinger induces equivalent symplectic structures on the moduli space of projective connections. Finally we show that under the monodromy map with base Bergman projective connection, the homological symplectic structure induces the Goldman bracket on the character variety. Following results of Kawai, the Bers base projective connection induces from the moduli of quadratic differentials an equivalent symplectic structure on the moduli space of projective connections. This is joint work with Marco Bertola and Dmitry Korotkin.