Seminar Differentialgeometrie

The Symplectic Structure of Representation Varieties

Wintersemester 2018/2019

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In 1984 William Goldman showed in [1] that the variety of representations of the fundamental group of a topological surface into any reductive Lie group carries a natural symplectic structure on its smooth part.

In this seminar we want to discuss first the construction of this symplectic structure both from the perspective in Goldman's paper as well as via symplectic reduction as described by Jeffrey and Weitsman. Then we will further explore the symplectic geometry and symplectic dynamics of representation varieties.

Organizational meeting on October 18th

Time and Location: Thursdays, 9-11am, SR 4

Registration: come to the organizational meeting on October 18th

Webpage: http://www.mathi.uni-heidelberg.de/∼mpfeil/seminarWS1819.html

Literature

[1] William M Goldman. The symplectic nature of fundamental groups of surfaces. *Advances in Mathematics*, 54(2):200–225, 1984.

[2] William M Goldman. Invariant functions on lie groups and hamiltonian flows of surface group representations. *Inventiones mathematicae*, 85(2):263–302, 1986.

[3] Lisa C Jeffrey. Flat connections on oriented 2-manifolds. *Bulletin of the London Mathematical Society*, 37(1):1–14, 2005.

[4] Lisa C Jeffrey and Jonathan Weitsman. Toric structures on the moduli space of flat connections on a riemann surface: volumes and the moment map. *Advances in Mathematics*, 106(2):151–168, 1994.