

FIM

Nachdiplomvorlesung

Sebastian Baader (Universität Bern)

Geometry of Surfaces

26 September to 19 December 2018

Wednesdays, 10:15 - 12:00

HG G 43, ETH Zürich, Rämistrasse 101

Abstract

The goal of these lectures is to become acquainted with geometric structures on surfaces and the classification of mapping classes. We will put special emphasis on open problems and recent results about pseudo-Anosov diffeomorphisms, in particular the ones with small dilatation. The problem of determining the lowest possible dilatation among all diffeomorphisms of a given surface is closely related to finding the lowest possible spectral radius >1 of an integer matrix of a given size, which in turn is an instance of the famous Lehmer problem.

One highlight will be the following result by Lanier and Margalit from this summer: non-trivial representations of the mapping class groups map all low-dilatation diffeomorphisms to non-trivial elements. Moreover, we will present Liechti's minor theoretic solution of the dilatation problem for Penner diffeomorphisms.

The two primary literature sources will be:

- Travaux de Thurston sur les difféomorphismes des surfaces by Fathi et al.
- A Primer on mapping class groups by Farb and Margalit.

However, we will not refrain from discussing original proofs every now and then, going back as far as 1857 with Kronecker. If you like pictorial proofs, this is the right lecture for you!

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