MATHEMATICAL INSTITUTE
OF THE UNIVERSITY OF BONN
DR. DES. ROBERT KUCHARCZYK
JPROF. DR. GABRIELA WEITZE-SCHMITHÜSEN

Seminar Geometrie (S2D1), Summer Semester 2015:

Translation Surfaces

Translation surfaces can be constructed by taking finitely many polygons in the Euclidean plane $\mathbb{R}^2$ and gluing their edges by translations in a way that leads to a connected, oriented surface without boundary. The resulting surface is locally (outside of finitely many points) isomorphic to $\mathbb{R}^2$ and thus carries itself a Euclidean structure. How do geodesics on the surface behave? How does the geometry of the surface change if you apply an affine map to the whole setting?
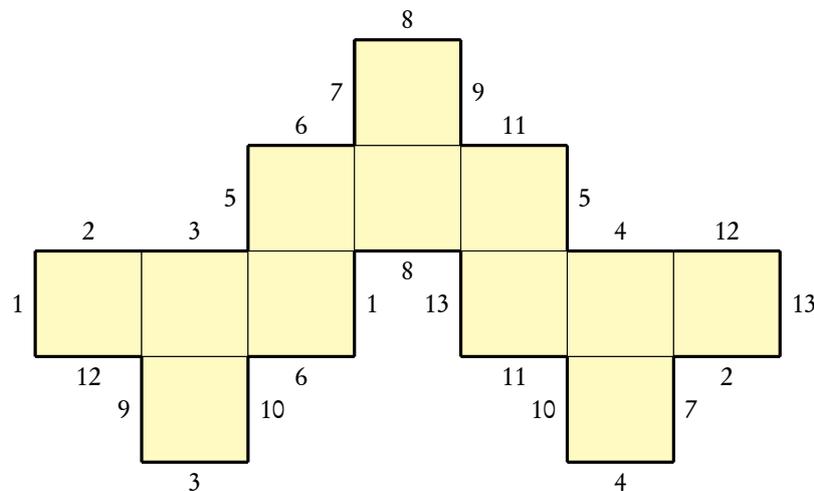
Glue edges which are labelled by the same letter. The result is a translation surface.

These simple questions lead to a surprisingly rich and deep theory. Some important tools for studying translation surfaces are *Veech groups*, which are discrete subgroups of $SL(2,\mathbb{R})$, *trace fields*, which are algebraic number fields, and *Teichmüller curves in the moduli space $\mathscr{M}_g$*, which are algebraic curves defined over some number field.

In this seminar we want to study these concepts. This will lead us to a small tour through different mathematical fields such as group theory, complex and algebraic geometry and number theory.

Prerequisites: We assume basic knowledge in topology and algebra. The seminar aims at bachelor-students in the sixth semester (and above) and at master students in their initial semesters.

Registration: There will be a preliminary discussion in which we present the topics of the talks

on Tuesday, February 3, 2015, 13:15, room 2.008

You can also register via e-mail to one of us.

Please find more information at: `http://www.math.uni-bonn.de/people/rak/` and
`http://www.math.kit.edu/iag3/~schmithuesen/`

If you have questions, please do not hesitate to contact us.

R. Kucharczyk: rak@math.uni-bonn.de   *G. Weitze-Schmithüsen:* weitze-schmithuesen@kit.edu