Self-intersection of curves on surfaces

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007 Kemeny Hall, 4:00 pm
(Tea 3:30 pm 300 Kemeny Hall)

Abstract

Consider an orientable surface S with boundary and a free homotopy class C of closed oriented curves in that surface. The combinatorial length of C is the minimum number of letters required for a description of C in terms of a set of standard generators of the fundamental group of S. The self-intersection of C is the minimum number of times in which a representative of C crosses itself. If the surface is endowed with a hyperbolic metric, then one can also define the geometry length of C, as the length of the unique geodesic representative in C. Several relations between combinatorial length, geometric length and self-intersection number will be discussed in the first part of the talk.

In the second part of the talk, the definition the Goldman-Tureav Lie bialgebra will be reviewed and it will be discussed how this algebraic structure relates to the intersection and self-intersection number of curves on an surface.

Parts of this work are joint with Fabiana Krongold, Steve Lalley and Anthony Phillips.

This talk should be accessible to graduate students.

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