

Algebraic structures related to closed curves on surfaces.

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Thursday, April 19, 2007
007 Kemeny Hall, 4:00 pm
(Tea 3:30 pm 300 Kemeny Hall)

Abstract

It is well known that one can attach a non-negative integer to any pair of free homotopy classes of curves on a surface: the minimal intersection number between any pair of representatives of these two classes.

It is also well known that given two curves with the same base-point one can multiply them and so the set of based homotopy classes becomes a group.

In the eighties, Goldman discovered a way to combine these two structures which yields a Lie algebra structure on the space of linear combinations of free homotopy classes.

I will discuss several aspects of this Lie algebra of curves on surfaces: definition, presentation, and some of the consequences of the algebraic properties of this structure on the topology. In particular, I will address the problem whether it is possible to characterize simple closed curves in terms of this Lie algebra and also, under which conditions one can recover from this Lie algebra the minimal intersection number.