

Topics in Geometry Seminar

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Vector Bundles

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Time: 11:30 - 1:00 PM

Room: Math & Stat Lounge 307.20

Abstract:

Everyone is familiar with the Mobius band, the twisted product of a circle and a line, as contrasted with an annulus which is the actual product of a circle and a line. Vector bundles are the natural generalization of the Mobius band and annulus, with the circle replaced by an arbitrary topological space, called the base space of the vector bundle, and the line replaced by a vector space of arbitrary finite dimension, called the fiber of the vector bundle. Vector bundles thus combine topology with linear algebra, and the study of vector bundles could be called Linear Algebraic Topology. In this talk, I will first give a precise definition of a vector bundle (over reals and complexes) followed by many examples. Next we will see some operations on vector bundles, including the direct sum, tensor product, conjugate, and exterior power. The second operation and the last one are particularly useful in K-theory.