

Graduate Seminar

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Thursday, September 18
1:00 pm., HH-3017.

Introduction to Lie Theory

Abstract:

Transformation groups are among the most important objects of modern mathematics. They play a prominent role in algebra, geometry, analysis, topology, differential equations, theoretical mechanics, etc.

The term "group" appeared in the work of Evariste Galois (1811 - 1832) on solvability of polynomial equations in one variable. In 1872, Felix Klein (1849 - 1925) proposed a unified view of geometry as the study of properties that are invariant under a given group of transformations. For example, Euclidean geometry arises if we consider the group of rigid motions of the real n -space, which is an example of what one may call a "continuous group". With the goal of constructing an analog of Galois theory for differential equations, Sophus Lie (1842 - 1899) undertook a systematic study of continuous groups, which are now called Lie groups, and discovered a way of attaching to each such group a linear object, now called a Lie algebra, which is easier to study and yet captures most of information about the group.

In this talk we will discuss the definitions, examples and basic properties of Lie groups and algebras.

