

# Algebra, Geometry, and Mathematical Physics Seminar

## A survey of Lie algebras, Part I

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### Abstract

Lie algebras is one of the basic notions of mathematics. They have various connections with and applications in different branches of mathematics and mathematical physics, for example in the string theory and conformal field theory. The beautiful classical theory of Lie algebras and Lie groups was developed by the middle of the last century, and it is connected with the names of S. Lie, W. Killing, H. Cartan and H. Weyl.

We will start with some basic examples of Lie algebras and their representations, and then will focus on complex simple finite-dimensional Lie algebras, root systems, Cartan matrices, Dynkin diagrams and Weyl groups.

The simple finite-dimensional Lie algebras are classified in terms of their Cartan matrices. Relaxing conditions on Cartan matrices, V. Kac and R. Moody introduced a new class of infinite-dimensional Lie algebras in 1968.

No previous knowledge about Lie algebras is needed.

Date: **Friday, November 20, 2009**

Time: 3:00pm–4:30pm

Place: MAGC 1.302

For further information or for special accommodations, please contact Dr. Sean Lawton via email at [lawtonsd@utpa.edu](mailto:lawtonsd@utpa.edu).