

An Introduction to Geometric Representation Theory

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It is often convenient to study groups via their actions on vector spaces (representations). The subject of geometric representation theory looks at geometric origins of these actions. This talk will briefly introduce representation theory and then look at one of the first examples of geometric representation theory; the Borel–Weil–Bott theorem which describes representations of a (reductive algebraic) Lie group from the induced action on meromorphic functions on a quotient of the group. This talk is introductory and will mainly focus on the example of $SL(2, \mathbb{C})$. Given time we will continue by describing representations of Lie algebras in terms of differential operators on the same quotient.