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Existence of moduli spaces for algebraic stacks - 2

Wednesday, 20 July 2022 11:30 (1 hour)

The aim of this lecture series is to introduce some recent developments in moduli theory which allows for an intrinsic approach to the construction of projective moduli spaces of objects that may have non-finite automorphism groups, e.g. moduli of semistable vector bundles on a curve. We will begin by introducing good moduli spaces for algebraic stacks, which can be viewed as a stack-theoretic categorization of GIT quotients. We will aim to provide necessary and sufficient conditions for the existence of good moduli spaces. This will require introducing the properties of Theta-reductivity and S-completeness, which are valuative criteria requiring the existence of extensions of morphisms over a codimension 2 point. We will motivate these concepts and develop their basic properties while providing numerous examples. We will then prove that in characteristic 0 that these conditions characterize precisely when an algebraic stack admits a separated good moduli space. In the final lecture, we will explain how this theory can be applied to give an alternative construction of a projective moduli space parameterizing S-equivalence classes of semistable vector bundles.

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