

Meeting: 998, Houston, Texas, SS 19A, Special Session on Algebraic Geometry

998-14-268 **Brendan E Hassett*** (hassett@math.rice.edu), Rice University, MS 136, Department of Mathematics, Houston, TX 77251-1892. *Classical models of moduli spaces of curves of small genus.*

For curves of small genus, classical invariant theory yields explicit projective compactifications of moduli spaces. Many of these have been known since the 19th century, e.g., Clebsch's analysis of binary sextics gives a compactification for curves of genus two.

From a modern standpoint, these compactifications leave something to be desired, as they do not always coarsely represent a functor. The points added at the boundary should themselves represent curves, perhaps with prescribed singularities. The most outstanding example is the Deligne-Mumford moduli space of stable curves.

Our approach is to apply the techniques of birational geometry to the moduli space of curves, with a view toward understanding classical compactifications from a modern viewpoint. Precisely, we introduce functors corresponding to several natural invariant-theoretic constructions of the moduli space of curves, and interpret the resulting compactifications as log-canonical models of the moduli space of stable curves. We will focus on the cases $g=2,3$, and 4, where the picture is especially clear. (Received March 01, 2004)