Eckart Viehweg (Universität Duisburg-Essen)

Title:

Compactifications of smooth families and of moduli spaces of polarized manifolds

Abstract:

Let M_h be the moduli scheme of canonically polarized manifolds with Hilbert polynomial h. We construct for a given finite set $\mathcal{I}$ of natural numbers $m > 1$ with $h(m) > 0$ a projective compactification $\bar{M}_h$ of the reduced scheme underlying M_h such that the ample invertible sheaf $\mathcal{L}$, corresponding to the determinant of the direct image of the m-th power of the relative dualizing sheaf on the moduli stack, has a natural extension $\bar{\mathcal{L}}$ to $\bar{M}_h$.

A similar result is shown for moduli of polarized minimal models of Kodaira dimension zero. In both cases "natural" means that the pullback of $\bar{\mathcal{L}}$ to a curve $C \to \bar{M}$, induced by a family $f : X \to C$, is isomorphic to the determinant of the direct image of the m-th power of the relative dualizing sheaf, whenever f is birational to a semi-stable family.

In both cases the points of $\bar{M}_h \setminus M_h$ have no modular interpretation. In the canonically polarized case, the Minimal Model Program should allow to construct a geometrically more meaningfull compactification.