Using Hodge theory to detect the structure of a compactified moduli space

Phillip Griffiths

Abstract

For a moduli space $\mathcal{M}$ of smooth general type varieties $\mathcal{X}$ with a given Hilbert polynominal $\chi(mK_\mathcal{X})$, Kollár-Shepherd-Barron-Alexeev proved the existence of a canonical completion $\overline{\mathcal{M}}$ For algebraic curves $\overline{\mathcal{M}}_g$ is well known and may be described Hodge theoretically. For algebraic surfaces the picture is quite different. We will discuss (i) some general results about how Hodge theory may be used, and (ii) how these results may be applied to help determine the structure of $\mathcal{M}$ for the I-surface. One new aspect is the definition and use of the derivitive of the period mapping at a singular surface.

*This talk is based on joint work with Mark Green, Radu Laza and Colleen Robles. The example is drawn from the work of Marco

Franciosi, Rita Pardini and Sonke Röllenske and on discussions that we have had with them.