

Title: Towards a Compactification of the Moduli Space of K3 Surfaces of Degree  
Two

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Abstract:

The problem of compactifying the moduli space of K3 surfaces of degree two is one that has attracted substantial attention, but remains without a satisfactory resolution. Two previous approaches to this problem are of particular relevance to this talk. Firstly there are the toroidal compactifications, originally constructed by Mumford, which may be described as blow-ups of the boundary in the well-known Baily-Borel compactification. These compactifications have the benefit of a very explicit construction, but they are not unique and it is unclear whether their boundaries are geometrically meaningful, in the sense of providing moduli for degenerate fibres. On the other hand, a more recent compactification was constructed by Hacking, using techniques from the minimal model program. Hacking's compactification has the opposite problem: it is geometrically meaningful by construction, but it is extremely difficult to give an explicit description of its boundary. In this talk I will describe recent progress in joint work with V. Alexeev, in which we are attempting to exhibit an explicit relationship between Hacking's compactification and a certain choice of toroidal compactification.