

Moduli spaces of stable maps have been of central interest in algebraic geometry for the last 30 years. In spite of that, the geometry of these spaces in genus bigger than zero is poorly understood, as the Kontsevich compactifications include many components of different dimensions meeting each other in complicated ways, and the closure of the smooth locus is difficult to describe. In recent years a new perspective on the problem of finding better behaved compactifications, ideally smooth ones, has come from log geometry. This approach has proved successful in a series of examples and log geometry is now becoming a natural setting to study modular resolutions of moduli spaces.

The aim of this series of talks will be to see how log geometry techniques apply to give modular smooth compactifications of moduli spaces of stable maps to projective spaces in genus one and two; we will also explain why the latter are interesting from an enumerative point of view.

In more detail: we begin by studying the deformation theory and the global geometry of moduli spaces of genus one and two stable maps; we then give a brief introduction to log schemes, line bundles on log schemes and log blowups and conclude by exhibiting the log modification resolving the moduli spaces of maps in genus one and two and explaining their modular meaning.