

## Birational geometry for d-critical loci and wall-crossing in Calabi-Yau 3-folds

Yukinobu Toda (Kavli IPMU)

Abstract: In this talk, I will discuss birational geometry for Joyce's d-critical loci, by introducing notions such as 'd-critical flips', 'd-critical flops', etc. I will show that several wall-crossing phenomena of moduli spaces of stable objects on Calabi-Yau 3-folds are described in terms of d-critical birational geometry, e.g. certain wall-crossing diagrams of Pandharipande-Thomas stable pair moduli spaces form a d-critical minimal model program. I will also show the existence of semi-orthogonal decompositions of the derived categories under simple d-critical flips satisfying some conditions. This is motivated by a d-critical analogue of Bondal-Orlov, Kawamata's D/K equivalence conjecture, and also gives a categorification of wall-crossing formula of Donaldson-Thomas invariants.