Yukinobu Toda: **Non-commutative thickening of moduli spaces of stable sheaves**

Non-commutative deformation theory of a module over an algebra was introduced by Laudal in 2002, which was later developed by Eriksen, Segal and Efimov-Lunts-Orlov. In 2013, Donovan-Wemyss used the universal non-commutative deformation algebras of floppable curves inside 3-folds to construct twist functors which describe flop-flop derived equivalences. In the last year, I described the dimensions of Donovan-Wemyss's algebras in terms of Katz's genus zero Gopakumar-Vafa invariants. This phenomena suggest that there might be an interesting Donaldson-Thomas type theory which captures non-commutative deformations of sheaves, and has some relations to the usual DT theory. In order to realize this story, one has to construct more or less global non-commutative moduli spaces of stable sheaves, and non-commutative virtual cycles. In this talk, I show that the moduli spaces of stable sheaves have a quasi-NC structure which generalizes Kapvanova's NC structure. If there is no higher obstruction space, this result is applied to construct non-commutative virtual structure sheaves on the moduli spaces of stable sheaves.