



# ALGEBRA AND GEOMETRY SEMINAR

The Hong Kong University of Science and Technology  
Department of Mathematics

## Conjectural equivalences of derived categories of Higgs bundles

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I will report on joint work with Yukinobu Toda (partially in progress) about the derived category of coherent sheaves of semistable Higgs bundles on a curve.

These categories have semiorthogonal decompositions in certain categories analogous to the “window categories” of Halpern-Leistner, Ballard-Favero-Katzarkov, Špenko-Van den Bergh. In the first half of the talk, I will discuss the general theory of “window categories”.

Next, I will focus on two conjectural dualities. The first is between semistable Higgs bundles of degree zero and a “limit” category. This equivalence aims to make precise the proposal of Donagi-Pantev of considering the classical limit of the de Rham Langlands equivalence. The second is a primitive version of the first, and it relates categories of sheaves on moduli of semistable Higgs bundles (for various degrees). This equivalence may be regarded as a version of the D-equivalence conjecture / SYZ mirror symmetry. We can prove (partial) versions of these conjectures for topological K-theory of these categories.

Room 6580 (lift 27/28) Fri, Dec 20, 2024 11:00 AM

