

# Cohomological Hall modules and Donaldson-Thomas theory with classical structure groups

Matt Young

**Résumé :** Given a complex reductive group  $G$ , there is expected to be a generalization of Donaldson-Thomas theory whose goal is to count, in an appropriate sense, stable principal  $G$ -bundles over a Calabi-Yau threefold. The standard Donaldson-Thomas theory arises when  $G$  is a general linear group. I will present some recent results on such a generalization when  $G$  is a classical group using the framework of quiver representations. The key new tool is a representation of Kontsevich and Soibelman's cohomological Hall algebra which is constructed from the cohomology of moduli stacks of quiver theoretic analogues of  $G$ -bundles. Conjecturally, the desired  $G$ -Donaldson-Thomas invariants are encoded in degrees of the generators of this representation. I will describe a number of situations where this conjecture has been confirmed.