Séminaire d'algèbre, topologie et géométrie
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Salle de conférences

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Skein-triangulated representations of generalised braids

Ordinary braid group Br_n is a well-known algebraic structure which encodes configurations of n non-touching strands ("braids") up to continious transformations ("isotopies"). There are many examples where Br_n acts categorically on the derived category of an algebraic variety : the minimal resolutions of Kleinian singularities, the cotangent bundles of flag varieties, etc.

In this talk, I will introduce a new structure : the category GBr_n of generalised braids. These are the braids whose strands are allowed to touch in a certain way. They have multiple endpoint configurations and can be non-invertible, thus forming a category rather than a group. In the context of triangulated categories, it is natural to impose certain relations which result in the notion of a skein-triangulated representation of GBr_n. These relations generalise the famous skein relation used to define oriented link invariants such as Jones polynomial.

We give two examples of skein-triangulated actions of GBr_n : on the cotangent bundles of varieties of full and partial flags in C^n and on categorical nil-Hecke algebras. The latter example, in fact, shows that any categorical action of Br_n can be lifted to a skein-triangulated action of GBr_n, generalising a result of Ed Segal for $n = 2$. This is a joint work with Rina Anno.