

Mutations and derived equivalences in the representation theory of commutative rings

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Abstract:

It is well-known that the structure of both the category of modules over a commutative noetherian ring R and its derived category are controlled by the prime spectrum of R . Through the notion of support, numerous classification results have been obtained for relevant subcategories of both categories.

In this talk we discuss t-structures in $D^b(\text{mod}(R))$ via their lifts to $D(\text{Mod}(R))$, following the recent approach of Marks and Zvonareva. We show that every intermediate t-structure in $D^b(\text{mod}(R))$ can be obtained by a sequence of right mutations of the injective cogenerator in $\text{Mod}(R)$, and that each mutation step induces a derived equivalence between the new heart and $\text{Mod}(R)$. This relies on the fact that hereditary torsion pairs of finite type in the hearts arising in this sequence of mutations are parametrised in the same way as in $\text{Mod}(R)$: via specialisation-closed subsets of $\text{Spec}(R)$. This talk is based in joint work with Sergio Pavon and in joint work with Lidia Angeleri Hügel, Rosanna Laking and Jan Šťovíček.