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Research field : Group Theory/Ring Theory/Combinatorics, Lie Groups/Lie Algebras/Representation Theory

Key words : Representation theory of orders, quiver, Cohen-Macaulay module, tilting theory, derived category, singularity category, cluster category, cluster algebra, non-commutative resolution of singularities

Present research : The ring theory is the study of rings, algebraic structures which generalize the system of numbers, and the representation theory of rings is the field of studying modules over a given ring. The representations of finite dimensional algebras over fields such as quivers, and the Cohen-Macaulay representations of orders over commutative rings, are controlled by the unified framework of Auslander-Reiten theory. In recent years, the study of the categorical structure of derived categories, together with triangulated categories called singular categories and cluster categories has been actively studied by using tilting theory and dg categories. Moreover, applications such as categorifications of cluster algebras and non-commutative resolutions of singularities are being actively investigated.

Notice for the students : This is a young field of mathematics. We welcome people with enthusiasm and ideas.