

Cohen-Macaulay modules over non-isolated surface singularities

Abstract:

The study of maximal Cohen-Macaulay modules over Noetherian local rings has its origin in the theory of integral representations of finite groups. It grew up from a very classical problem of classification of crystallographic groups, related with Hilbert's 18-th problem. One of the most spectacular applications of the theory of Cohen-Macaulay modules over surface singularities is a conceptual explanation of the so-called McKay correspondence for finite subgroups of $SL(2, \mathbb{C})$. In recent years, Cohen-Macaulay modules attracted a lot of attention because of their close relation with mirror symmetry and Landau-Ginzburg models in string theory.

In my talk, based on joint work with Yuriy Drozd, I shall explain the classification of indecomposable Cohen-Macaulay modules over a distinguished class of non-isolated Gorenstein surface singularities called degenerate cusps. Our results in particular lead to a complete description of matrix factorizations of the cubic potential xyz .

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