SEMINARIO

Sabir M. Gusein-Zade

Moscow State University

Exotic configuration spaces and generating series of their invariants

Abstract: A notion of exotic (ordered) configuration spaces of points on a space X was suggested by Yu. Baryshnikov. We consider unordered analogues of these spaces. They are generalizations of the usual configuration spaces $M_k X = \{(x_1, \dots, x_k) \in X^k : x_i \neq x_j \text{ for } i \neq j\}/S_k$ of $k$point subsets of X and of the symmetric powers $S^k X = X^k/S_k$. The idea is to consider collections of points of X marked by different "colours" when some collisions are permitted and some forbidden. For example, one can consider point coloured by red, blue and green so that no points of different colours may coincide, and also not more than m points of the same colour may coincide. For the classical configuration spaces one has Macdonald (type) equations. For example, for the symmetric powers one has

$$1 + \sum_{k=1}^{\infty} \chi(S^k X) t^k = (1-t)^{-\chi(X)}.$$

There are analogues of these equations for exotic configuration spaces. Moreover, if X is a quasiprojective variety, one has equations for the generating series of the classes of these configuration spaces in the Grothendieck ring of complex quasiprojective varieties. They are formulated in terms of the so-called power structure over this Grothendieck ring constracted earlier with I. Luengo and A. Melle. These equations imply equations for the generating series of other invariats, say, of the Hodge-Deligne polynomials.

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