SEMINARIO

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On a version of the Berglund-Hübsch-Henningson duality with non-abelian symmetry groups

Abstract: P.Berglund, T.Hübsch and M.Henningson found a method to construct mirror symmetric Calabi-Yau manifolds using so-called invertible polynomials: see details below. They considered pairs (f,G) consisting of an invertible polynomial f and a (finite abelian) group G of diagonal symmetries of f. To a pair (f,G) one associates the Berglund-Hübsch-Henningson (BHH) dual pair (f^,G^). There were found some symmetries between dual invertible polynomials and dual pairs not related directly with the mirror symmetry. (E.g., some of them hold when the corresponding manifolds are not Calabi-Yau. One of them was the so-called equivariant Saito duality as a duality between Burnside rings. A.Takahashi suggested a conjectural method to find symmetric pairs consisting of invertible polynomials and symmetry groups generated by some diagonal symmetries and some permutations of variables. The equivariant Saito duality was generalized to a case of non-abelian groups. It turns out that the corresponding symmetry holds only under a special condition on the action of the subgroup of the permutation group called here PC ("parity condition"). An inspection of data on Calabi-Yau threefolds obtained from quotients by non-abelian groups (taken from tables computed by X.Yu) shows that the pairs found on the basis of the method of Takahashi have symmetric pairs of Hodge numbers (and thus are hopefully mirror symmetric) if and only if they satisfy PC.

The talk is based on a joint work with W.Ebeling

Seminario IMUVA. Edificio LUCIA
Lunes 8 de Abril de 2019 (17:00)
Organiza: GIR SINGACOM