1050-53-5 **Octav Cornea***, Université de Montréal. *Lagrangian submanifolds: from physics to number theory.*

The study of Lagrangian submanifolds is motivated, in part, by problems of physical nature appearing in Hamiltonian dynamics but also, more recently, by issues related to string theory. In this talk I will review a number of recent developments in the subject - some obtained in joint work with Paul Biran - which show that the understanding of certain natural algebraic invariants associated to a class of Lagrangian submanifolds (called wide) is intimately related to the theory of quadratic forms. This relation is significant because it offers a conceptual perspective on the definition of some enumerative invariants involving genus zero pseudo-holomorphic curves with boundary. A variant of Hochschild homology plays an important role in this study. In essence, for a wide Lagrangian L the main symplectic algebraic invariant of interest is the quantum homology of L. This is a particular type of deformation of singular homology and Hochschild homology is the correct tool to understand the associated deformation theory. The theory of quadratic forms enters naturally here because there is a way to associate some interesting quadratic forms to the specific Hochschild co-homology classes that appear in the study of these deformations. Additionally, this version of Hochschild homology also relates this deformation theory to the topology of the free loop space of L. (Received May 15, 2008)