

**Meeting:** 1007, Santa Barbara, California, SS 5A, Special Session on Noncommutative Geometry and Algebra

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*noncommutative geometry and quiver algebras.*

We develop a new framework for Noncommutative Differential Geometry based on double derivations. This leads to the notion of moment map and of Hamiltonian reduction in Noncommutative Symplectic Geometry. For any smooth associative algebra  $B$ , we define its noncommutative cotangent bundle  $T^*B$ , which is a basic example of noncommutative symplectic manifold. Applying Hamiltonian reduction to noncommutative cotangent bundles gives an interesting class of associative algebras,  $P = P(B)$ , that includes preprojective algebras associated with quivers. Our formalism of noncommutative Hamiltonian reduction provides the space  $P/[P, P]$  with a Lie algebra structure, analogous to the Poisson bracket on the fiber of the moment map. In the special case where  $P$  is the preprojective algebra associated with quiver of non-Dynkin type, we give a complete description of Gerstenhaber algebra structure on the Hochschild cohomology of  $P$  in terms of the Lie algebra  $P/[P, P]$ . (Received February 12, 2005)