

Abstract

A family of quadratic algebras associated with quantum groups emerged in the work of Yuri Manin in the late 1980s. In the simplest example, such an algebra arises from 2×2 matrices whose 'coaction' preserves the 'quantum plane' with generators x, y , and the relation $yx = qxy$. We will discuss basic properties of the algebras and show that many classical identities have their counterparts for the associated Manin matrices. They include the MacMahon Master Theorem, Newton Identities and Cayley-Hamilton Theorem. We will also consider applications of these properties to descriptions of Casimir elements for the general linear Lie algebras with a surprising appearance of the Stirling numbers.