1033-20-1 **Daniel K. Nakano***, University of Georgia. *Bridging algebra and geometry via cohomology.*
Cohomology theories were developed throughout the 20th century by topologists to construct algebraic invariants for the investigation of manifolds and topological spaces. During this time, cohomology was also defined for algebraic structures like groups and Lie algebras to determine ways in which their representations can be glued together.

The purpose of this talk will be to demonstrate how cohomology theories for algebraic structures can be used to reintroduce the underlying geometry. For finite groups, these ideas started with the work of D. Quillen and J. Carlson. My talk with focus on the situation for the (small) quantum group $u_q(\mathfrak{g})$ where $\mathfrak{g}$ is a complex semisimple Lie algebra and q is a primitive lth root of unity. In this setting the spectrum of the cohomology ring identifies with certain subvarieties of the nilpotent cone $\mathcal{N}$. The nilpotent cone is a well-studied geometric object with beautiful combinatorial properties related to the associated root system and Weyl group Results will be shown which illustrate new connections between the (classical) orbit theory in $\mathcal{N}$ and the cohomology theory for quantum groups. (Received September 13, 2006)