

Cohomology and representation theory of algebraic and quantum groups  
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My main topic will be recent work with Parshall proving, with size restrictions on  $p$ , that Weyl modules (for semisimple algebraic groups  $G$  in positive characteristic  $p$ ) have  $p$ -filtrations. Moreover, these filtrations are compatible with the  $G_1$ -radical series in the regular weight case. This work has also produced new little quantum group gradings of quantum Weyl modules, and a proof of Koszulity for graded versions of generalized  $q$ -Schur algebras. Another (likely) consequence of the  $p$ -filtration work will be that  $\text{Ext}_{G_1}^n(L, L')$  groups with restricted irreducible coefficients  $L, L'$  have good filtrations ( $p$  large).

As time permits, I will also discuss the general metamorphosis this work describes of the quantum Koszul algebras above in passage to characteristic  $p$ , and discuss another project with Parshall on  $\text{Ext}^n$  with irreducible coefficients for quantum, algebraic, and related finite groups.