

November 7, 2012: In joint work with Juteau and Williamson, we introduce a new class of objects called parity sheaves. These objects are constructible complexes of sheaves on stratified varieties whose strata satisfy a cohomological parity vanishing condition. We show the existence and uniqueness of parity sheaves on several spaces arising in representation theory, including generalized flag varieties, nilpotent cones and toric varieties. With sheaf coefficients in a field of characteristic zero, parity sheaves correspond to classical objects in geometric representation theory. When the coefficients are of positive characteristic, parity sheaves are important new objects. Time permitting, I will explain how this is conjecturally related to recent joint work with Pramod Achar on the structure of the equivariant derived categories of nilpotent cones.