Title: A structure theorem for $RO(C_2)$-graded cohomology

Abstract: Computations of singular cohomology groups are very familiar. An equivariant analogue is $RO(G)$-graded Bredon cohomology with coefficients in a constant Mackey functor. Computations in this setting are often more challenging and are not well understood, even for the cyclic group of order two C_2. In this talk I will present a structure theorem for $RO(C_2)$-graded cohomology with $\underline{\mathbb{Z}/2}$ coefficients that substantially simplifies computations. The structure theorem says the cohomology of any finite C_2-CW complex decomposes as a direct sum of two basic pieces: shifted copies of the cohomology of a point and shifted copies of the cohomologies of spheres with the antipodal action. I will give some examples and sketch the proof, which depends on a Toda bracket calculation.