

1086-16-2572

**Colleen Duffy\*** ([duffycm@uwec.edu](mailto:duffycm@uwec.edu)). *Algebras associated to finite Coxeter groups.*

We can construct a graded algebra,  $A(\Gamma)$ , associated to a directed Hasse graph,  $\Gamma$ , of a regular polytope. This algebra is constructed by taking the quotient of the free algebra on the set of edges of the graph by the relations given by equating two directed paths having the same initial and final vertices. The Coxeter group,  $\mathcal{C}$ , which is the symmetry group of the polytope acts naturally on the graph, and so on each of the homogeneous subspaces of the algebra. For each element in the symmetry group, we find the Hilbert series of the graded subalgebra fixed under the action, called the graded trace generating function. We can use these functions to obtain the multiplicities of the irreducible  $\mathcal{C}$ -modules in the graded algebra.

This talk will focus on the algebra associated to the  $n$ -dimensional hypercube,  $\mathcal{C} = [4, 3^{n-2}]$ . We will discuss the ‘nice’ formulas we found for the graded trace functions and mention methods used to find them. At the end we will give the results for other regular polyhedra and how all these results can be extended. (Received September 25, 2012)