1145-16-2448　　　　　**Geoffrey Thayer Glover*** (`glovergt7775@uwec.edu`), 5708 Curtis St, McFarland, WI 53558.
Algebras associated with the Hasse graphs of polytopes. Preliminary report.

We can construct a graded algebra $A(\Gamma)$ associated to a directed Hasse graph, Γ, of a regular polytope 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 automorphism group of each graph is the symmetry group of the associated polytope. For each unique symmetry, we consider the Hasse subgraph consisting of fixed k-faces of the polytope under the action. From each Hasse subgraph, we determine the graded dimension of the related subalgebras of $A(\Gamma)$ by counting the directed paths between each pair of levels in the graph. Polynomials with the graded dimensions as the coefficients allow us to describe the complete algebraic structure of $A(\Gamma)$ using representation theory. Previous work has studied the finite Coxeter groups A_n, B_n, D_n, $I_2(p)$ and their related polytopes. In my talk I will discuss the computer programs we wrote to find the fixed faces under each symmetry and count the paths in each subgraph for the icosahedron (H_3) and how they can be extended to be used on the 600-cell (H_4) and the 24-cell (F_4). (Received September 25, 2018)