1145-05-2268 **Alexander Diaz-Lopez*** (`diazlopezalexander@gmail.com`), 800 Lancaster Ave, Villanova, PA 19006. *Peak polynomials and their coefficients.*

We say that a permutation $\pi = \pi_1\pi_2\cdots\pi_n \in \mathfrak{S}_n$ has a peak at index i if $\pi_{i-1} < \pi_i > \pi_{i+1}$. Let $\mathcal{P}(\pi)$ denote the set of indices where π has a peak. Given a set S of positive integers, we define $\mathcal{P}(S;n) = \{\pi \in \mathfrak{S}_n : \mathcal{P}(\pi) = S\}$. In 2013 Billey, Burdzy, and Sagan showed that for subsets of positive integers S and sufficiently large n, $|\mathcal{P}(S;n)| = p_S(n)2^{n-|S|-1}$ where $p_S(x)$ is a polynomial depending on S called the peak polynomial associated to S. In this talk we will study peak polynomials, their roots, peak positivity conjecture, as well as a combinatorial interpretation for the coefficients of $p_S(x)$ when written in a binomial basis. (Received September 25, 2018)