1125-05-632 **Alexander Diaz-Lopez**, **Lucas Everham** and **Pamela E Harris*** (peh2@williams.edu), Bronfman #204, 18 Hosxey Street, Williamstown, MA 01267, and **Erik Insko**, **Vincent Marcantonio** and **Mohamed Omar**. *Peak Sets of Graphs.*

If G is a connected graph with n vertices denoted $v_0, \ldots, v_{n-1}$, then a permutation of length n corresponds to a labeling (or n-coloring) of the vertices of G. We say that a permutation π has a peak at the vertex v_i on G if the label of v_i is greater than all of the labels of v_i's neighboring vertices, with the caveat that we do not allow peaks at vertices of degree 1 or 0, as these are more like cliffs than peaks. The G-peak set of a permutation π is defined to be the set $P_G(\pi) = \{i \in [n] : \ \pi \text{ has a peak at the vertex } v_i\}$, where $[n] = \{1, 2, 3, \ldots, n\}$. Given a subset $S \subseteq V(G)$ we denote the set of all permutations with G-peak set S by $\mathcal{P}_S(G) = \{\pi \in \mathfrak{S}_n \mid P_G(\pi) = S\}$. We note that the peaks sets $P_S(n)$ originally studied by Billey, Burdzy, and Sagan corresponded to studying peak sets on the path graph P_n, i.e., $P_S(n) = \mathcal{P}_S(G)$ where $G = P_n$. In this talk, we present a recursive formula for enumerating $|\mathcal{P}_S(G)|$ and provide closed formulas for the number of permutations with a given peak set for a collection of interesting families of graphs. (Received September 08, 2016)