1145-05-2480 **Bonnie C Jacob*** (bcjntm@rit.edu), **Abraham Glasser**, **Emily Lederman** and **Stanislaw Radziszowski**. *Failed power domination: complexity and other select results.*

Let G be a simple graph with vertex set V and edge set E, and let $S \subseteq V$. The *open neighborhood* of $v \in V$, $N(v)$, is the set of vertices adjacent to v; the *closed neighborhood* is given by $N[v] = N(v) \cup \{v\}$. The *open neighborhood* of S, $N(S)$, is the union of the open neighborhoods of vertices in S, and the *closed neighborhood* of S, is $N[S] = S \cup N(S)$. The sets $\mathcal{P}^i(S), i \geq 0$, of vertices *monitored* by S at Step i are given by $\mathcal{P}^0(S) = N[S]$ and $\mathcal{P}^{i+1}(S) = \mathcal{P}^i(S) \bigcup \{w : \{w\} = N[v] \backslash \mathcal{P}^i(S)$ for some $v \in \mathcal{P}^i(S)\}$. If there exists j such that $\mathcal{P}^j(S) = V$, then S is called a *power dominating set*, PDS, of G.

In this talk, I introduce the *failed power domination number* of a graph G, $\bar{\gamma}_p(G)$, the largest cardinality of a set that is not a PDS. I sketch a proof that $\bar{\gamma}_p(G)$ is NP-hard to compute and determine graphs in which any single vertex is a PDS. (Received September 25, 2018)