

## Rainbow Dominating Sets of Graphs

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A subset of vertices  $D$  of a graph  $G$  is called a **dominating set** if every vertex in  $V(G) \setminus D$  has a neighbor in  $D$ . Given a collection  $\Sigma = (D_1, \dots, D_k)$  of (not necessarily distinct) dominating sets of  $G$ , we say that  $\Sigma$  **admits a rainbow dominating set** if there exists a dominating set  $D$  of  $G$  and an injective function  $f : D \rightarrow \{1, \dots, k\}$  such that  $d$  is in  $D_{f(d)}$  for all  $d$  in  $D$ . We define **rainbow domination number** of  $G$ ,  $R(G)$ , to be equal to the smallest  $k$  such that every collection  $\Sigma$  of  $k$  dominating sets of  $G$ , admits a rainbow dominating set. In this talk we discuss various computations and bounds (upper and lower) for  $R(G)$  and pose several conjectures and open problems pertaining to  $R(G)$ .