Title: Extremal questions for $H$-colorings of graphs

Abstract:
An $H$-coloring of a finite, simple graph $G$ is a map from the vertices of $G$ to the vertices of a finite graph $H$ (without multiple edges, but possibly with loops) that preserves edge adjacency. $H$-colorings generalize many important graph theoretic notions, such as proper $q$-colorings (via $H = K_q$) and independent sets (via $H$ as an edge with a loop on one endvertex).

After familiarizing ourselves with the notion of an $H$-coloring, we will consider the following extremal graph theory question: given a family of graphs $\mathcal{G}$, which graph in the family has the largest number $H$-colorings for a given $H$? We present several recent results for $\mathcal{G}(n, \delta)$, the family of graphs on $n$ vertices with minimum degree $\delta$. 