Backbone coloring of planar graphs

Ana Shirley F. Silva (UFC)

Resumo/Abstract:
Given a graph $G$, and a spanning subgraph $H$ of $G$, a backbone $k$-coloring of $(G, H)$ is a proper $k$-coloring of $G$ such that the distance between the colors of the extremities of every edge in $H$ is at least 2. The backbone chromatic number of $(G, H)$ is the minimum number of colors needed in any backbone coloring of $(G, H)$. These concepts were introduced around 2003 by Broersma, Fomin, Golovach and Woeginger, and have received much attention since then. Observe that a proper $k$-coloring of $G$ can be easily transformed into a backbone $(2k - 1)$-coloring of $(G, H)$ simply by using only odd colors $\{1, \cdots, 2k - 1\}$. Also, in general this is tight since $BBC(G, G) = 2\chi(G) - 1$. Hence, most of the works investigate the restriction of the problem to certain types of backbones. In particular, many conjectures and questions have been posed on the value $BBC(G, H)$, when $G$ is restricted to planar graphs and $H$ is restricted to some other class of graphs. In this seminar, we will talk about the state of the art of the problem restricted to planar graphs.