Planar Graphs with Girth 20 are Additively 3-choosable

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The *additive choice number* of a graph G, denoted $ch_\Sigma(G)$, is the minimum positive integer k such that whenever each vertex is given a list of at least k positive integers, vertex labels can be chosen from respective lists in such a way that adjacent vertices have distinct sums of labels on their neighbors. Recently, bounds on the additive choice number have been obtained for planar graphs under certain girth assumptions. In this talk, we give a history of these bounds and present the proof that for a planar graph G with girth at least 20, $ch_\Sigma(G) \leq 3$. Our approach applies the Combinatorial Nullstellensatz to streamline arguments within a proof using the discharging method.

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