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Can Cop Number Equal Independence Number?

In 2022 Turcotte asked if $c(G) < \alpha(G)$ for all graphs with $\alpha(G) \geq 3$. Recently, Char, Maniya, and Pradhan proved this is false when $\alpha = 3$ by demonstrating a single graph with cop number and independence number 3. The problem was not resolved for graphs with independence number greater than 3. We settle this problem using random graphs by proving the stronger result that for all $k \geq 1$ there exists a graph G such that $c(G) = \alpha(G) = \theta(G) = k$. Next, we consider the structure of graphs achieving $c(G) = \theta(G)$, and in doing so we prove that if G is a perfect graph with $\alpha(G) \geq 4$ then $c(G) < \alpha(G)$.

This is joint work with Imed Zaguia.