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Aaron J Maurer* (maurera@carleton.edu), **John M McCauley** (jmccaule@haverford.edu)
and **Silviya D Valeva** (valev20s@mtholyoke.edu). *Cops and Robbers on Planar Graphs.*

In the game of *Cops and Robbers* on a graph $G = (V, E)$, k cops try to catch a robber. On the cop turn, each cop may move to a neighboring vertex or remain in place. On the robber's turn, he moves similarly. The cops win if there is some time at which a cop is at the same vertex as the robber. Otherwise, the robber wins. The minimum number of cops required to catch the robber is called the *cop number* of G , and is denoted $c(G)$. The game of Cops and Robbers has applications in robotics and in search and rescue operations.

A classic result of Aigner and Fromme shows that if G is planar then $c(G) \leq 3$. We characterize the following families of planar graphs as having $c(G) \leq 2$: series parallel graphs, outerplanar graphs, maximal 2-outerplanar graphs, and maximal planar graphs with maximum degree at most 5. We also show that every graph G with $|V| \leq 9$ has $c(G) \leq 2$. This bound is tight, since the Petersen graph (on 10 vertices) requires 3 cops. (Received September 21, 2010)