1067-05-440 **Drago Bokal**, **Bogdan Oporowski** and **R. Bruce Richter*** (brichter@uwaterloo.ca), Dept. of Combinatorics & Optimization, University of Waterloo, Waterloo, ON N2L 3G1, Canada, and **Gelasio Salazar**. *2-crossing-critical graphs.*

A graph $G$ is $k$-crossing-critical if the crossing number $cr(G)$ is at least $k$, but, for every proper subgraph $H$ of $G$, $cr(H) < k$. (We ignore vertices with degree 2, as they play no role in the crossing number of a graph.) From Kuratowski's Theorem, the only 1-crossing-critical graphs are the complete graph $K_5$ and the complete bipartite graph $K_{3,3}$.

In this project, we prove that if $G$ is 3-connected, 2-crossing-critical, and has at least ten million vertices, then $G$ has a very special, completely determined, circular structure. The proof shows that if $G$ has a Möbius ladder $V_{10}$ as a minor, then $G$ has the structure. If $G$ has no $V_{10}$-minor, then it has bounded size.

We know how to determine all the 3-connected, 2-crossing-critical graphs with no $V_8$-minor, so what remains to be determined is those with a $V_8$-minor but no $V_{10}$-minor. (Received September 03, 2010)