Strongly Pancyclic and Dual-Pancyclic Graphs
Terry McKee
Wright State University

Say that a cycle $C$ almost contains a cycle $C^-$ if every edge except one of $C^-$ is an edge of $C$. (E.g., the house graph’s 5-cycle almost contains its 3-cycle and its 4-cycle, but the 4-cycle does not almost contain the 3-cycle.) Call a graph $G$ strongly pancyclic if every nontriangular cycle $C$ almost contains another cycle $C^-$ and every nonspanning cycle $C$ is almost contained in another cycle $C^+$. As the name suggests, a strongly pancyclic graph is pancyclic (i.e., has cycles of all lengths, 3 to $|V(G)|$). I characterize and show properties of strongly pancyclic graphs and consider a dual notion that, in some ways, behaves even more nicely.