Packing and covering of edge-disjoint graphs

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Every graph either contains k disjoint cycles or a set of at most $O(k \log k)$ vertices that meets all cycles – this is what the classic Erdős-Pósa theorem asserts. Since it was proved in 1965, it has become clear that similar results hold not only for cycles but for other graph classes, too: even cycles, subdivisions of K_4, A-paths, and so on.

But what about edge-disjoint cycles? Does every graph also contain k edge-disjoint cycles, or a set of at most $O(k \log k)$ edges that meets all cycles? Yes, and this is in fact not hard to prove. Moreover, many of the same classes for which there is an Erdős-Pósa type result, i.e., even cycles, subdivisions of K_4, A-paths, also satisfy an edge-analogue. For other graph classes, however, e.g., large walls, long ladders, there is a difference between the ordinary Erdős-Pósa setting and the edge-analogue. In the talk, I will speak mostly about packing and covering edge-disjoint graphs, and why that is different from packing vertex-disjoint graphs.