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*The mean subtree order of a graph under edge addition*

For a graph  $G$ , the *mean subtree order* is the average order of a subtree of  $G$ . The mean subtree order was introduced for trees by Jamison in a series of seminal papers in the 1980s. Very recently, Chin, Gordon, MacPhee, and Vincent extended this notion to graphs and conjectured that for every connected graph, adding an edge between any pair of distinct vertices will increase the mean subtree order. In this talk, we show that the conjecture is false by constructing graphs of order  $n$  where the addition of a single edge can decrease the mean subtree order by as much as  $n/3$  asymptotically. We then amend the original conjecture and prove it in the special case that  $G$  is a tree.

(This is joint work with Lucas Mol)