p-Groups with maximal elementary abelian subgroups of rank 2

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Let p be an odd prime number and G a finite p-group. In this talk, we will prove that if the rank of G is greater than p, then G has no maximal elementary abelian subgroup of rank 2. It follows that if G has rank greater than p, then the poset $E(G)$ of elementary abelian subgroups of G of rank at least 2 is connected and the torsion-free rank of the group of endotrivial kG-modules is one, for any field k of characteristic p. Time permitting, we will also discuss the class-breadth conjecture for the p-groups G whose poset $E(G)$ has more than one component. This is joint work with George Glauberman.