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Normal Limits of Nilpotents in C-Algebras*

In 1974 Herrero completely classified when a bounded normal operator on a complex, infinite dimensional, separable Hilbert space was a norm limit of bounded nilpotent operators. In this brief talk I will examine the C*-analog of this problem; that is, given a C*-algebra \mathfrak{A} and a normal operator $N \in \mathfrak{A}$, when is N a norm limit of nilpotent operators from \mathfrak{A} ? In particular, I will discuss this problem for von Neumann algebras (based on type decomposition), unital simple purely infinite C*-algebras (which include the Cuntz algebras), and approximately finite dimensional C*-algebras. It is surprising that Herrero's result generalize to many of these C*-algebras yet in others this classification problem is incredibly complex.