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Noncommutative dilation theory

Dilation theory of a single operator began in 1953 with Bela Sz.Nagy's result that every operator on Hilbert space with norm at most 1 is the upper corner of a 2x2 lower triangular operator matrix which is an isometry. This led to a powerful functional calculus for studying a single operator on Hilbert space. In 1968, William Arveson set out a general theory for studying nonself-adjoint subalgebras of C*-algebras through their representation theory, and the main pillar was a generalization of the Sz.Nagy dilation theory. In the past four decades, these ideas have been developed into a major tool for studying these algebras. I will survey some of these ideas.