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Stephan Ramon Garcia*, Department of Mathematics, Pomona College, 610 N. College Ave,
Claremont, CA 91711. *On a problem of Halmos: unitary equivalence of a matrix to its transpose.*

Halmos asked whether every square complex matrix is unitarily equivalent to its transpose (UET). Ad hoc examples indicate that the answer is no. In this talk, we give a complete characterization of matrices which are UET. Surprisingly, the naïve conjecture that a matrix is UET if and only if it is unitarily equivalent to a complex symmetric (i.e., self-transpose) matrix is true in dimensions $n \leq 7$ but false for $n \geq 8$. In particular, unexpected building blocks begin to appear in dimensions 6 and 8. This is joint work with James E. Tener. (Received September 05, 2014)