

1114-47-180

**Stephan Ramon Garcia\*** ([stephan.garcia@pomona.edu](mailto:stephan.garcia@pomona.edu)), 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 appear in dimensions 6 and 8. (Received August 26, 2015)