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**Alexander Belton, Dominique Guillot, Apoorva Khare\*** (khare@stanford.edu) and  
**Mihai Putinar.** *Schur polynomials and linear matrix inequalities for Hadamard powers.*

We characterize the polynomials of degree  $N > 0$ , which when applied entrywise to the cone of positive  $N \times N$  matrices, preserve positivity. This result provides a quantitative version in fixed dimension of Schoenberg's celebrated theorem. By recasting our result as a tight linear matrix inequality for matrix pencils, we derive asymptotically sharp bounds for the matrix cube problem for Hadamard powers. The proof of our result makes use of a novel determinantal identity involving Schur polynomials. (Received September 02, 2016)