

1077-AH-2956 **Grigoriy Blekherman*** (greg@math.gatech.edu), School of Mathematics, Georgia Institute of Technology, Atlanta, GA 30332. *Nonnegative Polynomials and Sums of Squares*.

I will review the history and motivation behind the problem of representing nonnegative polynomials as sums of squares. Such representations are of interest for both theoretical and practical computational reasons. However, some basic and explicit questions about nonnegative polynomials and sums of squares remains open. Our journey will begin with Hilbert's theorem, which shows that nonnegative polynomials that are not sums of squares exist, and end with recent results on the nature of the relationship between nonnegative polynomials and sums of squares. On the way we will see a fascinating blend of ideas from convex and algebraic geometry that are used to attack these questions. (Received September 23, 2011)