Positive trace polynomials

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Trace polynomials are polynomials in noncommuting variables and traces of their products. They can be naturally evaluated in finite von Neumann algebras. While originating in invariant theory as equivariant maps between tuples of matrices, trace polynomials more recently received attention in operator algebra, free probability and quantum information theory. This talk addresses positivity of their evaluations and presents new Positivstellensätze (=algebraic certificates for positivity) in terms of sums of squares and traces of sums of squares.