A long-standing conjecture asserts that the polynomial

\[ p(t) = \text{tr}[(A + tB)^m] \]

has nonnegative coefficients whenever \( m \) is a positive integer and \( A \) and \( B \) are any two \( n \times n \) positive semidefinite Hermitian matrices. The conjecture arises from a question raised by Bessis, Moussa, and Villani (1975) in connection with a problem in theoretical physics. Their conjecture, as shown recently by Lieb and Seiringer, is equivalent to the trace positivity statement above. We discuss recent advances on this conjecture and outline a general program that has had some recent success. (Received September 12, 2007)