



2008 Colloquium Series



Dr. Ken Dykema

Professor

Department of Mathematics

Texas A&M University

Friday, April 25, 2008

Time: 2:00 - 3:00 PM

Room: BB 3.03.24

On sums of Hermitian matrices and approximations of infinite dimensional operators

Abstract: A classical problem is: given n -by- n Hermitian matrices A and B whose eigenvalues (and multiplicities) are known, what can the eigenvalues of their sum $A + B$ be? In a remarkable paper from 1962, Alfred Horn described for every n a list of eigenvalue inequalities and conjectured that they yield the solution to the problem. This conjecture was proved at the end of the century, due to work of many authors, including principally Klyachko, Knutson and Tao. A key step is showing that certain intersections of Schubert varieties are nonempty. A similar problem can be considered for various classes of operators on infinite dimensional Hilbert space. If we consider one class of such operators (those that lie in finite von Neumann algebras), then this question turns out to be related to a fundamental open problem concerning approximation of such operators, known as Connes's embedding problem. We will describe this relationship and report on recent progress (in work with H. Bercovici, B. Collins, W.-S. Li and D. Timotin) on proving the analogues of Horn's inequalities in finite von Neumann algebras.

A reception will follow the talk and will be held in Room BB 3.03.24