Wing Suet Li (Georgia Institute of Technology)
Intersection of subspaces and Horn inequalities for the eigenvalues of sums of selfadjoint operators

Abstract

Let A, B, C be n by n selfadjoint matrices. It was conjectured by Horn in 1962 that the relation $A + B + C = 0$ can be characterized by a set of inequalities (Horn inequalities) together with the trace equality. The conjecture was proved in the late 1990s due to the work of Klyachko, Knutson and Tao, using highly sophisticated tools from algebraic geometry. In this talk we will discuss some basic ideas on the intersection of subspaces that will lead to inequalities of the eigenvalues of sums of selfadjoint operators, which leads to an elementary proof of the Horn inequalities that can be generalized to the finite Von Neumann albegras. I will also discuss some open questions that our techniques suggested.