

# Victor Vinnikov

will speak on

## Matrix Convexity

Monday, October 19, 2005

Korman 247, at 2:00

**Abstract:** An old theorem of Ando states that if a real polynomial  $p(x)$  in one variable is matrix convex, meaning that

$$p(tX + (1 - t)Y) \leq tp(X) + (1 - t)p(Y)$$

for all real symmetric matrices  $X, Y$  (of any size) and any  $t$  in  $[0, 1]$ , then  $p(x)$  has degree at most two. I will present a similar result for polynomials in several noncommuting variables. I will discuss the ideas behind the proof of this result, which involve noncommutative derivatives and noncommutative realization theory. Time permitting I will also mention some results and conjectures generalizing this to noncommutative rational functions on the one hand and noncommutative entire functions on the other. This is a joint work with Bill Helton and Scott McCullough.