Undergraduate Math Club
Winter 2006
2nd floor Nesbitt Common Room
February 9, 4:10-5:00pm
(free pizza and pop, as always)

Prof. Joel Tropp

Uncertainty Principles meet Linear Algebra

Abstract

Heisenberg's uncertainty principle says that the position and momentum of a particle cannot be simultaneously measured with high precision. In abstract form, this famous result forbids a function from being concentrated in both time and frequency. Donoho and Stark established a similar result for vectors in 1989. We will prove the Donoho-Stark uncertainty principle by means of a surprising connection to basic linear algebra. The technique involves recent results on the uniqueness of sparse solutions to underdetermined systems of linear equations.