

**The University of Chicago**

Department of Statistics

**Seminar**

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**“Some Families of Probability Distributions Within Quantum Theory”**

**Monday, April 28, 2003 at 4:00 PM**  
**133 Eckhart Hall, 5734 S. University Avenue**

**ABSTRACT**

Some basics of quantum theory are presented including the way an experiment is modeled. Then states, observables, expected values, spectral measure, and probabilities are introduced. An example of spin measurement is discussed in the context of Stern Gerlach experiments. In order to describe an example of a one-parameter family of probability distributions, the concept of unitary representations of the rotation group in relation to spin is discussed. The matrix elements of these operators lead to the binomial family. Certain coherent states related to the (quantum) harmonic oscillator lead to Hermite and Poisson distributions. The normal distribution arises in relation to position and linear momentum measurements.

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3/27/03