

# GRADUATE SEMINAR

**Anupam Roy**

Studies on quadratic matrix equations  
associated with regular  $M$ -matrices

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**Friday, November 18**

**2.30 PM**

**Math/Stat Lounge (CW307.20)**

**Abstract:** We study the quadratic matrix equation  $X^2 - EX - F = 0$ , where  $E$  is a diagonal matrix and  $F$  is a regular  $M$ -matrix. Quadratic matrix equations of this kind arise in noisy Wiener-Hopf problems for Markov chains. The solution of practical interest is a special  $M$ -matrix solution. The existence and uniqueness of  $M$ -matrix solutions are studied by transforming the equation into a nonsymmetric algebraic Riccati equation for which the four coefficient matrices form a regular  $M$ -matrix. We also discuss two numerical methods to compute the desired  $M$ -matrix solutions and examine their convergence.