THE MATHEMATICS DEPARTMENT PRESENTS

A MATHEMATICS COLLOQUIUM

THURSDAY, February 12, 2009
BOND HALL 217
4:00 pm

Title: **Krylov Subspace Methods for Systems of Linear Equations**

Speaker: **Bryan Smith**, Western Washington University

Abstract:

Krylov subspace methods are a class of iterative methods for solving systems of linear equations. These methods are useful for large matrices when LU factorization is too costly. Krylov methods attempt to find a suitable approximation to the solution at substantially lower computational cost. These methods are particularly useful for very large sparse matrices, for example, those that arise from the discretization of partial differential equations. I will discuss two different Krylov subspace methods: the Conjugate Gradient Method for symmetric positive definite matrices, and the Generalized Minimal Residual Method for general invertible matrices. I will also discuss preconditioning, a technique to improve the condition number or other characteristic of the matrix and thereby accelerate the convergence of these methods.

Refreshments will precede the talk at 3:30pm in Bond Hall 300
courtesy of Dr. Tjalling Ypma