962-65-1121   **Doreen De Leon*** (`ddeleon@math.ucla.edu`). *Wavelet Techniques Applied to Multigrid Methods.* In this talk, we discuss the application of wavelet transforms to multigrid methods. Although the standard multigrid method is useful in reducing the convergence time for solving systems of algebraic equations obtained from the discretization of partial differential equations, for some problems convergence independent of mesh size is not obtained. Such problems include problems with discontinuous or highly oscillatory diffusion, advection-diffusion problems with dominant advection, and anisotropic diffusion problems. The method employed here involves the use of a Schur complement, obtained after application of a wavelet transform to the original problem, to determine the interpolation, restriction, and coarse grid operators. To make these methods more computationally efficient, the inverse component is approximated, first by using ILU(0) to obtain the LU-decomposition and then by truncating to prevent fill-in in the inverse. We present numerical results, comparing this method to standard and algebraic multigrid methods, as well as to multigrid using homogenization, wherever appropriate. (Received October 02, 2000)