



McGill Computational Science and Engineering Seminar



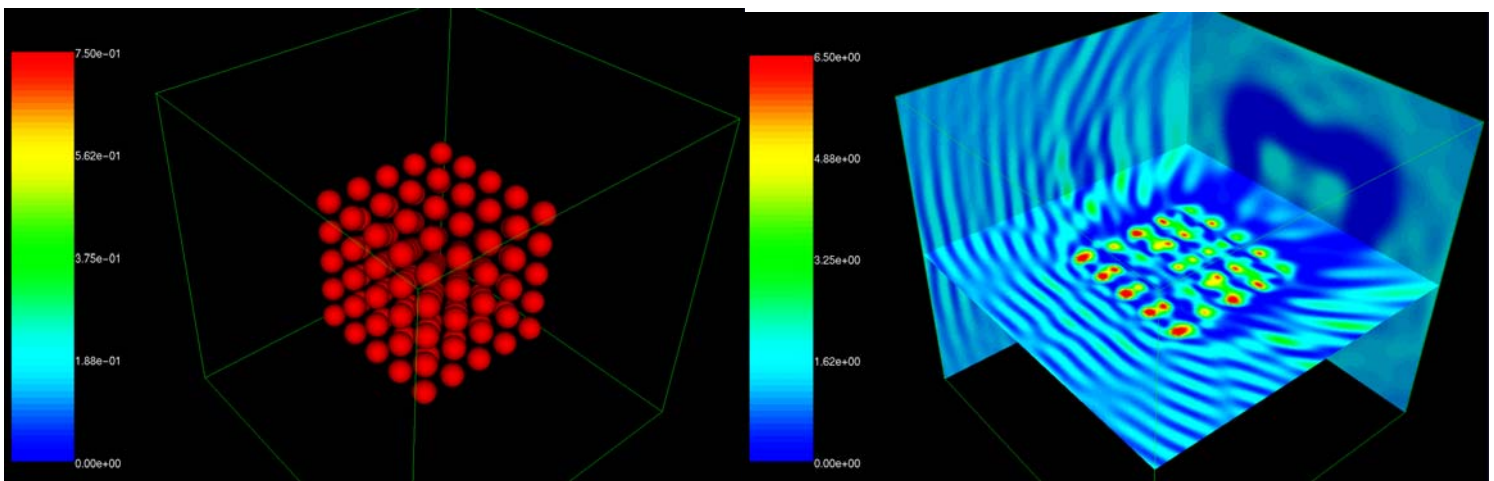
2:30 pm, Friday, April 8, 2005 McConnell Engineering Bldg. Rm. 13

Fast, High-Order Integral Equation Methods for Scattering by Inhomogeneous Media

Professor E. McKay Hyde, Computational and Applied Mathematics, Rice University

The numerical simulation of wave interactions with complex material structures propel technological advances in a wide range of scientific and engineering applications including radar and remote sensing, medical and biological imaging, and communications. Integral equation methods for the time-harmonic scattering problem are attractive since the radiation condition at infinity is automatically satisfied (no absorbing boundary condition is required) and only the scattering obstacle itself needs to be discretized. However, there has been limited success in developing integral equation methods which are both efficient and high-order accurate.

We will present recent work on integral equation methods that are both efficient ($O(N \log N)$ complexity) and high-order accurate in computing the time-harmonic scattering by inhomogeneous media. The efficiency of our methods relies on the use of fast Fourier transforms (FFTs) while the high-order accuracy results from systematic use of partitions of unity, regularizing changes of variables, and Fourier smoothing of the refractive index.



Coffee and snacks will be served in Room 603 after the seminar.