



# Applied Mathematics

## McGill Applied Mathematics Seminar

Sep. 18, 2006, 2:35 pm Monday  
At McGill, Burnside Hall 1205

**“High-order scattering solvers and surface representation algorithms.”**

Oscar Bruno  
Applied and Computational Mathematics  
Caltech

*Coffee and refreshments will be served after the seminar*

### Abstract:

We present a new set of algorithms and methodologies for the numerical solution of problems of scattering by complex bodies in three-dimensional space. These methods, which are based on integral equations, high-order integration, fast Fourier transforms and highly accurate high-frequency methods, can be used in the solution of problems of electromagnetic and acoustic scattering by surfaces and penetrable scatterers - even in cases in which the scatterers contain geometric singularities such as corners and edges. In all cases the solvers exhibit high-order convergence, they run on low memories and reduced operation counts, and they result in solutions with a high degree of accuracy. In this talk I will describe the basic methodology associated with these approaches. In particular, I will touch upon a new class of high-order surface representation methods introduced recently, which, starting from given CAD data can produce high-order-accurate parametrizations, suitable for numerical simulations, of complex surfaces in three-dimensional space.

