FALL 2013 COURSE:

MtSE 788: APPLIED COMPUTATIONAL METHODS IN PHYSICS AND MATERIALS SCIENCE

Time: Tue. 6:00-9:05 pm [the time can be changed, if everyone in the class agrees, since currently it conflicts with Phys 731. If you would like to register for both courses, please contact the Dept. Administration to receive a Conflict Permit].

The course will be dealing with problems from various areas of Physics (including Materials Science), which are either too hard or impossible to study analytically, and where computational approaches can provide a significant additional insight. Major application will include random walk and diffusion problems, examples from electrostatics of conductors and dielectrics and from optics, Monte Carlo simulations of phase transformations, etc.

The main emphasis will be on demonstrating the connection between the physical formulation of the problem, and its mathematical and computational realizations. (Thus, a detailed physical introduction will be given for each of the problems considered). Some previous computational experience could be helpful, but is not required. Similarly, this course can be taken independently of Phys/MtSE 688. A powerful Mathematica program will be used, which provides extensive numerical, analytical and graphical capabilities.

The course will balance interests of physics and materials science students. Differentiation will take place later in the course when students select or suggest individual research projects.

For a flavor of the course, see previous


although in the present version the topics, notes and syllabus will be updated.

Send an e-mail to vitaly@njit.edu for more information.

Figure 1: