

Graduate Physics Seminar

Monday, 23 May 2011 from 3 PM

University of Nova Gorica, Ajdovščina Site

Auditorium

Qingguo Liu

University of Nova Gorica

Laboratory for Multiphase Processes

**Non-Singular Method of Fundamental Solutions and its Application to Two
Dimensional Elasticity Problems**

Abstract

In this seminar, an overview of previous applications of method of fundamental solutions (MFS) for isotropic and anisotropic elasticity problems is given. The application of a nonsingular method of fundamental solutions (NMFS) in two-dimensional isotropic linear elasticity is originally developed, where the NMFS is based on the MFS with regularization of the singularities. In the traditional MFS, a fictitious boundary for placing the source points is required, in order to cancel out the singularity of the fundamental solution. However, in the NMFS, the source points and the collocation points coincide and both are placed on the boundary of the problem domain. To remove the singularities of the fundamental solutions, the concentrated point sources are replaced by the distributed sources over areas covering the source points. Principles to determine the coefficients for different boundary conditions are discussed. Examples of two-dimensional isotropic linear elasticity problems are presented, with displacement and traction boundary conditions, to demonstrate the feasibility and accuracy of the newly developed NMFS for elasticity problems. At the end of the seminar, a definition of the problem of deformation of multi-granular media, as appears in deformation of the metallic microstructures, will be given. This problem will be addressed by the NMFS within the scope of my graduate research activities.