

Mathematics Graduate Seminar

First Speaker: Razan Abu-Ladeh
Memorial University

Thursday, March 9, 2017
1:00p.m., HH-3017

Introduction to Multigrid Methods.

Abstract:

I will talk about the basics of the multigrid process, (the basic elements in multigrid methods), and what problem lead to the development of these methods.

Second Speaker: Zhe Huang
Memorial University

Thursday, March 9, 2017
1:30p.m., HH-3017

*Dark Solitons of (2+1)-dimensional Gross-Pitaevskii Equation
with Spatially-periodic External Potential*

Abstract:

In this talk, I will report my thesis work. We study the existence and stability of background solutions (BGS) and dark soliton solutions (DSS) of the Gross-Pitaevskii equation (GPE) with spatially-periodic external potential in (2+1)-dimensional space in three cases: the general case, the case of large chemical potential, and the case of slowly varying external potential. In the first case, we use dynamical system theory to prove the existence of stationary solutions (BGS and DSS), and for other two cases, we apply asymptotic analysis to obtain the formulas of the stationary solutions. The stability/instability of the solutions is investigated. By means of perturbation theory, we find the critical wave numbers for stable modes in those three different cases. The analytical results are supported by direct numerical computation of the stationary solutions as well as the computation of corresponding eigenvalue problems. This talk is based on a joint work with Dr. Chunhua Ou.