

SPECIAL APPLIED MATHEMATICS AFTERNOON

DEPARTMENT OF MATHEMATICS

UNIVERSITY OF WEST GEORGIA

3:00 PM - 6:00 PM FRIDAY, APRIL 17, 2009, BOYD 301

1601 MAPLE STREET, CARROLLTON, GA 30118

3:00 PM - 4:00 PM: Prof. Alexandre Boukhgueim, Department of Mathematics & Statistics, Wichita State University

Invitation to Inverse Problems

This will be nontechnical overview with examples of concrete inverse problems from quantum mechanics, seismology, gravimetry, and medicine.

4:00 PM - 5:00 PM: Prof. Frithjof Lutscher, Department of Mathematics and Statistics, University of Ottawa

Mathematical models in spatial ecology: persistence and invasion on land and in rivers

Since the work of Skellam in the mid 1950s mathematical models have been used to tackle questions in spatial ecology such as: How much space does a species need to persist? or: How fast will a successful invasive species spread into a new territory? Many of these questions can be formulated as parabolic differential equations and their qualitative behavior. I will review two basic concepts, namely the critical patch size and the invasion speed. I will then show how each of these quantities changes in systems with unidirectional flow such as rivers or longshore currents. In the final part of my talk, I will explore mechanisms for 2 and 3 competing species to coexist spatially. The talk is aimed at a general audience with an emphasis on ideas and concepts and a minimal amount of formalisms and proofs.

5:00 PM - 6:00 PM: Prof. Alexandre Boukhgueim, Department of Mathematics & Statistics, Wichita State University

Recovering a potential from the Cauchy data in the two-dimensional case

We show that the Cauchy (or scattering on fixed energy) data for the Schrodinger equation in the two-dimensional case determines a bounded potential with compact support uniquely. We also obtain a linear inversion formula for smooth potentials.

6:00 PM – Dinner at the Mansion