PDE, Complex Analysis and Differential Geometry Seminar

UNIVERSITY OF NOTRE DAME
Department of Mathematics

Speaker: Dionyssis Mantzavinos
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Friday, September 23, 2016
4:00 PM
258 Hurley Hall

Title: Initial-boundary value problems for the nonlinear Schr\"odinger (NLS) and the Korteweg-de Vries (KdV) equations

Abstract:

We use the unified transform method of Fokas for linear initial-boundary value problems in order to derive solution formulae for the linearized NLS and KdV equations on the half-line, supplemented with a Dirichlet or a Neumann boundary condition. We next use these formulae to define iteration maps for the solutions of the corresponding nonlinear problems. Then, employing a contraction mapping argument in a suitably chosen space we prove existence, uniqueness and continuous dependence on the data of the solution of each of these two problems. This is joint work with Alex Himonas and Thanasis Fokas.