COLOQUIO DE ANÁLISIS Y FÍSICA–MATEMÁTICA

Organizers: Dr. Rafael del Río and Dr. Ricardo Weder

EXPLICIT FORMULAS FOR EXACT SOLUTIONS TO INTEGRABLE EVOLUTION EQUATIONS

Prof. Tuncay Aktosun
Departamento de Matemáticas
University of Texas at Arlington

Abstract

A method is presented to construct exact solutions to certain integrable nonlinear evolution equations that are solvable by the inverse scattering transform method involving a Marchenko integral equation. An explicit formula and its <u>equivalents</u> are obtained for each integrable equation to express such exact solutions in a compact form in terms of a triple of constant matrices and matrix exponentials. Such exact solutions can alternatively be written explicitly as algebraic combinations of exponential, trigonometric, and polynomial functions of the spatial and temporal coordinates. The method is applicable to various equations such as the Korteweg-de Vries equation, the nonlinear Schrödinger equation, and the sine-Gordon equation.
    This is a joint work with F. Demontis and C. van der Mee from University of Cagliari, Italy.

28 de enero de 2011

◊

ORIGINS OF DIFFUSION

Dr. Antti Kupiainen
Departamento de Matemáticas
Universidad de Helsinki, Finland

Abstract

The derivation of diffusion from a conservative microscopic dynamics is one of the fundamental problems in mathematical physics. We discuss this problem in two cases: a classical dynamical system of coupled maps with conserved energy variable and a quantum particle interacting with a quantum environment.

21 de enero de 2011