



FMSP Lectures

Murray Muraskin

(University of North Dakota, Grand Forks)

Mathematical Aesthetic Principles and Nonintegrable Systems

September 26 (Mon) 16:00 ~ 17:30 Room 056

Abstract:

The discussion presents a study of a set of mathematical principles that can be classified as "aesthetic" and shows that these principles can be cast into a set of nonlinear equations. The system of equations is nonintegrable in general. New techniques to handle the nonintegrability feature are discussed. We then illustrate how this system of equations leads to sinusoidal solutions, sine within sine solutions, the phenomenon known as beats, random type oscillations, two and three dimensional lattices, as well as multi wave packet systems. The sinusoidal solutions occur when the arbitrary data associated with the equations causes the equations to be linearized. The sinusoidal behavior totally disappears once the integrability equations are satisfied, illustrating how important the nonintegrability concept is to the development.