



KOÇ UNIVERSITY

Science – Math Seminar

Speaker: Ali Mostafazadeh
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Date: Thursday, Feb. 17, 2005
Time: 16:45 (Tea and cookies will be served at 16:30)
Place: Science Building, Room Z42

Title: Pseudo-Hermitian Quantum Mechanics and PT-Symmetry

Abstract:

Since 1998 there have appeared about 250 research papers on quantum systems having non-Hermitian but PT-symmetric Hamiltonians. In this talk, I will outline a general framework called “Pseudo-Hermitian Quantum Mechanics” that allows for a complete and consistent formulation of quantum mechanics based on a class of non-Hermitian Hamiltonians that includes PT-symmetric Hamiltonians as special cases. I will then explore the physical content of some concrete PT-symmetric systems revealing an intriguing duality between certain local but non-Hermitian Hamiltonians and certain nonlocal but Hermitian Hamiltonians.

Note: The talk will essentially be a pedagogical summary of a program I initiated in a series of three papers published in 2002 [J. Math. Phys. **43** (2002) 205-214, 2814-2816, 3944-3951] that attempted to reveal the underlying mathematical structure of what is termed as PT-symmetric quantum mechanics. These papers indeed achieved much more as they formed the basis of a general framework called pseudo-Hermitian quantum mechanics that has subsequently found applications in as diverse areas of physics as quantum cosmology, magnetohydrodynamics, quantum optics, etc. The first of these papers has so far received 108 citations which is the highest number of citations received by an article published in 2002 with an author residing in Turkey. The three papers are the most cited three papers of Koç University.

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