



KOÇ UNIVERSITY

Math-Science Seminar

Speaker: Ali Mostafazadeh (Department of Mathematics, Koç University)

Title: Dynamical Invariants and the Geometric Phase

Date and Time: Thursday, March 1, 4:45 pm.*

Place: Room Z42, Science Building, Koç University, Rumelifeneri Yolu, Sariyer 80910 Istanbul, Turkey.

Abstract: In this talk I will present a pedagogical introduction to the theory of dynamical invariants and its application for geometric phases. A particular manifestation of a geometric phase was originally discovered by chemists in their study of the quantum dynamics of molecules within the framework of the Born-Oppenheimer approximation. The notion of a geometric phase was later formulated by Michael Berry who showed its generality and importance in various areas of physics. Shortly after the announcement of Berry's results, mathematicians gave an intriguing interpretation of Berry's phase in terms of the holonomies of certain fiber bundles. In this talk I will briefly review Berry's phase, its mathematical interpretation, the standard formulation of the nonadiabatic geometric phase and its relationship with the theory of universal classifying bundles and connections. I will then introduce dynamical invariants and discuss a formulation of the geometric phase (and its generalizations) using the theory of dynamical invariants. I will conclude the talk with some recent results on the geometrically equivalent quantum systems.

*Refreshments to be served in Science Building, Room Z40 at 4:30 pm.