

SEMINÁRIO DE ANÁLISE

Multi-Time Schrödinger Equations

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Mini-auditório do MAT

Abstract

Non-relativistic quantum mechanics is governed by the well-known Schrödinger equation, a PDE for a wave function ψ from time \times (physicalspace) ^{N} (for N particles) to a complex vector space. While hugely successful in the non-relativistic domain, the application of the Schrödinger equation is limited, as it is not invariant under the Poincare group, i.e., the symmetry group of the special theory of relativity.

In this talk, I will describe a generalization of the Schrödinger equation to the relativistic domain: multi-time Schrödinger equations. These are systems of N PDEs, each describing the evolution in the time coordinate of one of the N particles in space-time. The consistency of such an (overdetermined) system of PDEs poses interesting challenges and important restrictions for the possible physical interactions. In the talk, I will give an introduction to the topic, including the physical motivation, the most important mathematical results, as well as exciting new topics of research.