

Title: Superoscillatory Sequences and Infinite Order Differential Operators

Abstract: In this talk I will discuss superoscillating sequences, an interesting phenomenon that arises from the theory of weak values in quantum mechanics, and I will in particular talk about the question of longevity of superoscillatory behavior when initial data are evolved according to suitable Schrodinger equations. The main instrument in dealing with these questions is the theory of infinite order differential operators and the description of the topologies of suitable spaces of entire functions, a description that relies on the theory of LF and DF spaces. This theory is one of the many areas in which Grothendieck's impact has been central.

Grothendieck's work on topological vector spaces took place mostly in the early fifties, when he proved many fundamental results that he presented in the course he taught in Sao Paulo in 1954. The notes of that course remain a cornerstone for this theory, and while my work only takes advantage of his results, it shows the far ranging applications of ideas that are now almost seventy years old.