Topic: Pointwise Ergodic Theorem along a Subsequence of the Integers.

Abstract: After Birkhoff's Pointwise Ergodic Theorem was proved in 1931, there have been many attempts to generalize the theorem along a subsequence of the integers instead of taking the entire sequence (n). In this talk, we will present the following result of Roger Jones and Máté Wierdl:

If a sequence (a_n) satisfies $\dfrac{a_{n+1}}{a_n} \geq 1 + \dfrac{1}{(\log n)^{\frac{1}{2}-\epsilon}}$, for some $\epsilon > 0$, then in any aperiodic dynamical system (X, Σ, μ, T), we can always find a function $f \in L^2$ such that the Cesàro averages along the sequence (a_n) which is defined by

$$A_{n\in[N]}f(T^{a_n}x) := \frac{1}{N} \sum_{n\in[N]} f(T^{a_n}x) \qquad (0.1)$$

fail to converge in a set of positive measure.