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Differential Equations and Applied Math Seminar

Dr. Giorgio Young, Rice University

12-1pm February 11th, 2022

330 DH and Zoom

Title: Ballistic Transport for Limit-periodic Schrödinger Operators in One Dimension

Abstract: In this talk, I will discuss some recent results on the transport properties of the class of limit-periodic continuum Schrödinger operators whose potentials are approximated exponentially quickly by a sequence of periodic functions. For such an operator H, and $X_H(t)$ the Heisenberg evolution of the position operator, we show the limit of $\frac{1}{t}X_H(t)\psi$ as $t \to \infty$ exists and is nonzero for $\psi \neq 0$ belonging to a dense subspace of initial states that are sufficiently regular and of suitably rapid decay. This is viewed as a particularly strong form of ballistic transport, and this is the first time it has been proven in a continuum almost periodic non-periodic setting. In particular, this statement implies that for the initial states considered, the second moment grows quadratically in time.

Interested faculty, graduate and undergraduate students are encouraged to attend.