A survey on the almost everywhere convergence problem for the Schrödinger equation

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Abstract

The Schrödinger equation $\partial_t u = i\Delta u$ with initial datum f contained in a Sobolev space $H^s(\mathbb{R}^n)$ has solution $e^{it\Delta}f$. The problem of finding the optimal value of s which guarantees that $e^{it\Delta}f(x) \to f(x)$ as $t \to 0$ at almost all $x \in \mathbb{R}^n$ has been posed by Lennart Carleson in 1980 and is still open for $n > 1$. The purpose of this talk is to give a non-technical introduction to this problem and its history.