

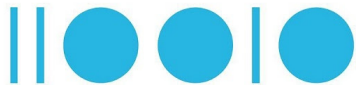


DEPARTMENT OF
MATHEMATICS



Association for
Women in
Mathematics

50th Anniversary
1971 - 2021



The AWM Distinguished Colloquium Series

LILLIAN PIERCE

Duke
University

WEDNESDAY,
APRIL 20 at 3:15 pm
on Zoom

Counterexamples for
generalizations of
the Schrödinger
maximal operator



Abstract:

In 1980 Carleson posed a question: how “well-behaved” must an initial data function be, to guarantee pointwise convergence of the solution of the linear Schrödinger equation? After progress by many authors, this was recently resolved (up to the endpoint) by a combination of two celebrated results: one by Bourgain, whose counterexample construction for the Schrödinger maximal operator proved a necessary condition, and a complementary result of Du and Zhang, who proved a sufficient condition. In this talk we describe a study of Bourgain’s counterexamples, from first principles. Then we describe a new flexible number-theoretic method for constructing counterexamples, which opens the door to studying convergence questions for many more dispersive PDEs. Along the way we’ll see why no mathematics we learn is ever wasted, and how the boundary from one mathematical area to another is not always clear.

About the Speaker:

Lillian Pierce is Leonardy Professor of Mathematics at Duke University. She graduated as valedictorian from Princeton University in 2002 and won a Rhodes scholarship to study at Oxford, where she earned her Master’s degree. Pierce earned her Ph.D. from Princeton in 2009. Her research combines harmonic analysis and number theory. Pierce has been awarded a Presidential Early Career Award in Science and Engineering, a Sloan Research Fellowship, the AWM Sadosky Prize, and the Birman Fellowship for Women Scientists; she was named a Fellow of the American Mathematical Society in 2021. Pierce is the co-founder and Editor-in-Chief of the new journal “Essential Number Theory.”