Brin MRC Distinguished Lecture

Dual Lyapunov Exponents and the Robust Ten Martini Problem

Svetlana Jitomirskaya, UC Berkeley

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Time: 3:15 PM

Location: 3206 Kirwan Hall

Abstract

The Hofstadter butterfly, a plot of the band spectra of almost Mathieu operators at rational frequencies, has become a pictorial symbol of the field of quasiperiodic operators and has gained renewed prominence through experimental study of moire materials. It is visually clear from this plot that for all irrational frequencies the spectrum must be a Cantor set, a statement that has been dubbed the ten martini problem. It has been established for the almost Mathieu operators, exploiiting various special features of this family. We will discuss a recently developed robust method allowing to establish it for a large class of one-frequency quasiperiodic operators, including nonperturbative analytic neighborhoods of several popular explicit families. The proof builds on the recently developed concept of dual Lyapunov exponents and partial hyperbolicity of the dual cocycles . Based on joint papers with L. Ge, J. You, and Q. Zhou.

Svetlana Jitomirskaya is a Goldman Distinguished Chair Professor at UC Berkeley. She grew up in Kharkiv, Ukraine; both her parents were Holocaust survivors. She obtained Ph.D. at Moscow State University in 1991, and then worked at UC Irvine, from 1991 until 2023, rising there through the ranks from a part-time lecturer to Distinguished Professor. She has also held the inaugural Hubbard Chair at Georgia Tech in 2022-23. Svetlana's research in mathematical physics has been recognized by various prizes, including the AMS Satter Prize (2005), APS & AIP Heineman Prize (2019), the inaugural Ladyzhenskaya Prize (2022), and the inaugural Barry Prize (2023). She was an invited session (2002) and plenary (2023) speaker at the ICM. She is an elected member of the AAAS, NAS, and AASL.