Center for Applied Mathematical Sciences
Distinguished Lecturer, Spring 2023

Svetlana Jitomirskaya

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Fractal properties of the Hofstadter butterfly, eigenvalues of the almost Mathieu operator, and topological phase transitions

Abstract: Harper's operator - the 2D discrete magnetic Laplacian - is the model behind the Hofstadter's butterfly and Thouless theory of the Quantum Hall Effect. It reduces to the critical almost Mathieu family, indexed by the phase. We will present a complete proof of singular continuous spectrum for the critical family, for all phases, finishing a program with a long history. The proof is based on a simple Fourier analysis and a new Aubry duality-type transform. We will also explain how these ideas provide for a very simple proof of zero measure of the spectrum of Harper's operator, a problem previously solved by sophisticated dynamical systems techniques, as well as progress on some other outstanding conjectures.

Monday, April 24 2023

Kaprielian Hall

Reception: 3:00 p.m.
KAP 410

Lecture: 3:30p.m.
KAP 414

Wine & Cheese: 4:30 p.m.
KAP 410

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Dana and David Dornsife
College of Letters, Arts and Sciences

Svetlana Jitomirskaya is a Distinguished Professor of Mathematics at the University of California at Irvine and the Inaugural Hubbard Chair Professor at Georgia Tech. She is well known for her work in dynamical systems and mathematical physics. She was an invited speaker at the ICM in Beijing in 2002. She was elected to the American Academy of Arts and Sciences in 2018. She was the winner of the Dannie Heineman Prize for mathematical physics in 2020. She was elected to the National Academy of Sciences in 2022. She received the inaugural Ladyzhenskaya Prize in mathematical physics in 2022 at the ICM in Helsinki.