

Department of Mathematics, BGU

Colloquium

On *Tuesday, May, 16 2023*

At *14:30 – 15:30*

In *Math 101-*

Mira Shamis (Queen Mary University of London)

will talk about

On the abominable properties of the Almost Mathieu Operator with Liouville frequencies

Abstract: This talk is devoted to the study of some spectral properties of the Almost Mathieu Operator – a one-dimensional discrete Schrödinger operator with potential generated by an irrational rotation with angle α (called the frequency). The spectral properties of the Almost Mathieu operator depend sensitively on the arithmetic properties of the frequency. If the frequency is poorly approximated by rationals, the spectral properties are as nice as one would expect.

The focus of this talk will be on the complementary case of well-approximated frequencies, in which the state of affairs is completely different. We show that in this case several spectral characteristics of the Almost Mathieu Operator can be as poor as at all possible in the class of all discrete Schrödinger operators. For example, the modulus of continuity of the integrated density of states (that is, of the averaged spectral measure) may be no better than logarithmic (for comparison,

for poorly approximated frequencies the integrated density of states satisfies a Hölder condition). Other characteristics to be discussed are the Hausdorff measure of the spectrum and the non-homogeneity of the spectrum (as a set).

Based on joint work with A. Avila, Y. Last, and Q. Zhou