

*Texas State University
Department of Mathematics Colloquium
Friday, February 4, 2022
3:30pm on Zoom*

What is quantum chaos?



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Abstract: Where do eigenfunctions of the Laplacian concentrate as eigenvalues go to infinity? Do they equidistribute or do they concentrate in an uneven way? It turns out that the answer depends on the nature of the geodesic flow. I will discuss various results in the case when the flow is chaotic: the Quantum Ergodicity theorem of Shnirelman, Colin de Verdiere, and Zelditch, the Quantum Unique Ergodicity conjecture of Rudnick--Sarnak, the progress on it by Lindenstrauss and Soundararajan, and the entropy bounds of Anantharaman--Nonnenmacher. I will conclude with a more recent lower bound on the mass of eigenfunctions obtained with Jin and Nonnenmacher. It relies on a new tool called "fractal uncertainty principle" developed in the works with Bourgain and Zahl.

