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Signatures of Random Matrix Theory in the Discrete Energy Spectra of Shaped Disordered Metallic Clusters LAURA ADAMS, BRIAN LANG, ALLEN GOLDMAN, University of Minnesota — It has been predicted that the distribution of the discrete energy levels of disordered metallic clusters should follow random matrix theory. It has been possible to study distributions of energy levels for different shaped metallic clusters using a low temperature scanning tunneling microscope. Depending on the degree of "shape" disorder, the statistics either follow Wigner-Dyson statistics, a mixed state, or Poisson-like statistics for the distribution of energy levels. We will present a summary of results on Pb clusters grown by a buffer layered assisted growth technique and in addition show how it is possible to use scanning tunneling spectroscopy to image a quantity proportional to the square of the amplitude of the eigenfunctions for quantum confined systems. These images resemble images acquired in microwave cavity experiments for classically chaotic and nonchaotic systems. This work was supported by the Department of Energy under grant DE-FG02-02ER46004.

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