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Thermodynamics of Maximum Transition Entropy for Quantum Assemblies DAVID ROGERS, University of South Florida — We present one possible unifying framework for the statistics of driven quantum systems in terms of a stochastic propagator for the density matrix. Its classical limit [Rogers, Beck and Rempe, J. Stat. Phys 145:385, 2011] takes the form of a Langevin equation with an associated large-deviation functional intimately related to the partition function of statistical mechanics. Surprising results of this quantum theory are that work is a measurable quantity, and that a precise form of the second law of thermodynamics can be stated for dynamical systems. Numerical results are presented for the time-course of work and heat production for trapped 1D particles. Properties of the large deviation functional are discussed in the context of the quantum measurement problem.

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