Gauge-gravity duality – super Yang-Mills quantum mechanics

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We describe the conjectured holographic duality between Yang-Mills quantum mechanics and type IIa string theory. This duality allows us to use lattice Monte Carlo simulations to probe the physics of the gravitational theory - for example, at low energies it provides a computation of black hole entropy in terms of a sum over microstates of the dual gauge theory. Numerical results are presented of the 4 supercharge theory at finite temperature.