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Quantum mechanics on the adelic class group

Tate's global integral formula for the zeta function can be interpreted as an inner product of the ground state of a harmonic oscillator on the adèles with an eigenstate of the Berry-Keating hamiltonian xp . The latter lives most naturally on the adelic class group. In other systems, similar inner products can be shown to be related to spectral determinants; doing so in this case would prove the Riemann hypothesis. The key missing ingredient is a formulation of the harmonic oscillator on the adelic class group.