

Abstract Submitted
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Quantum statistical mechanics on infinitely ramified fractals JOE

P. CHEN, Cornell University — I present the thermodynamics of identical particles confined in infinitely ramified, exactly self-similar fractals, such as the Sierpinski carpet (in 2D) and the Menger sponge (in 3D). Recent results from analysis on fractals have established that the heat kernel associated with the Laplacian on such fractals satisfy, in the short-time regime, a scaling relation with exponent $d_S/2$ (where d_S is the spectral dimension) modulated by log-periodic oscillations. I explain how such a scaling affects the partition function, and the resultant thermodynamics associated with blackbody radiation [1], Casimir effect, and electrons in the fractal box.

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