

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Partition function and space-filling fractal-like networks of branching tubes SAMIR LIPOVACA — We may think of the probability in quantum mechanics as a sort of fluid that flows from one point to another continuously and without loss or gain. We will utilize this fluid idea and imagine that probability flows through a space-filling fractal-like networks of branching tubes similar to the networks of a general model for the origin of allometric scaling laws in biology. In the general model, scaling laws arise from the interplay between physical and geometric constraints. This model provides a complete analysis of scaling relations for mammalian circulatory systems that are in agreement with data. We will show that there is a connection between a quantum system in thermal equilibrium and space-filling fractal-like networks. The relationship will be revealed through the calculation of the total fluid (probability) network volume. We will show that this total volume is proportional to the partition function of the related quantum system.

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Date submitted: 11 Nov 2008

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