

# Review of: "Hamiltonian Chaos and the Fractal Topology of Spacetime (Part 1)"

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**Potential competing interests:** No potential competing interests to declare.

The author first poses interesting questions concerning the global topology of the spacetime and a foam-like structure of the early Universe. He attempts to relate the latter to the theory of chaotic nonlinear systems. The rest of the paper is devoted to a brief discussion of Hamiltonian systems, including the notion of Arnold-Liouville integrability, Poincare map, ergodicity and mixing (although the difference between two last notions is not stressed). The decay of invariant KAM tori when the parameters entering Hamiltonian approach their critical values is briefly illustrated using simple model of nonlinear oscillators. Unfortunately, the relation of the Hamiltonian theory of chaotic systems to the cosmological questions posed in the introductory part is not revealed. However, it is only Part 1 of the paper so we can expect more details in Part 2.