Abstract Submitted
for the SES21 Meeting of
The American Physical Society

A novel efficient four-dimensional foam and its application in computational particle modeling ELIA DMITRIEFF, Irkutsk State University, Quantum Gravity Research — A problem of finding space partitioning into cells of equal volume with the least area of surface between them was established by Lord Kelvin[1] in 1887 in a framework of the ether theory. The problem still has the proven[2] solution just for 2D space, that is a regular hexagon tiling. Original Kelvin conjecture in 3D, that is the bitruncated cubic honeycomb, got the counterexample[3] in 1993. We propose the candidate solution for the Kelvin problem in 4D that appears more simple and more efficient than the best known 3D solution. It is a regular foam of uniform 26-cell polytopes. Its properties allow us to consider it as a prospective basic spacetime computational model possessing CPT symmetry. Some anti-structure defects of this tessellation could be mapped to known SM fundamental particles manifesting correct quantum numbers[4]. We discuss arguments in favor of generalizing the original problem to be any-dimensional, and existing of the only solution of it, namely one we proposed.

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[3]Weaire D., Phelan R. Phil. Mag. Lett. **69**, 2 (1994).
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Date submitted: 29 Sep 2021 Electronic form version 1.4