

The cosmological constant from two curvature components in a discrete arithmetic cosmos

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Abstract

I show that the observed value of the cosmological constant, $\Lambda \approx 10^{-122}$ in Planck units, follows from two independently meaningful and empirically known values, with no free parameters and no fine-tuning.

The derivation is built on a discrete arithmetic framework of N constituents, Logarithmic Pole Model, presented in the companion poster. The major contributor to its $N \approx 2.8 \times 10^{89}$ constituents are the CMB photons. Under LPM, the space is a 3-sphere with a radius $R = N^{1/2}$, thus giving a radial curvature $\approx 3.6 \times 10^{-90}$

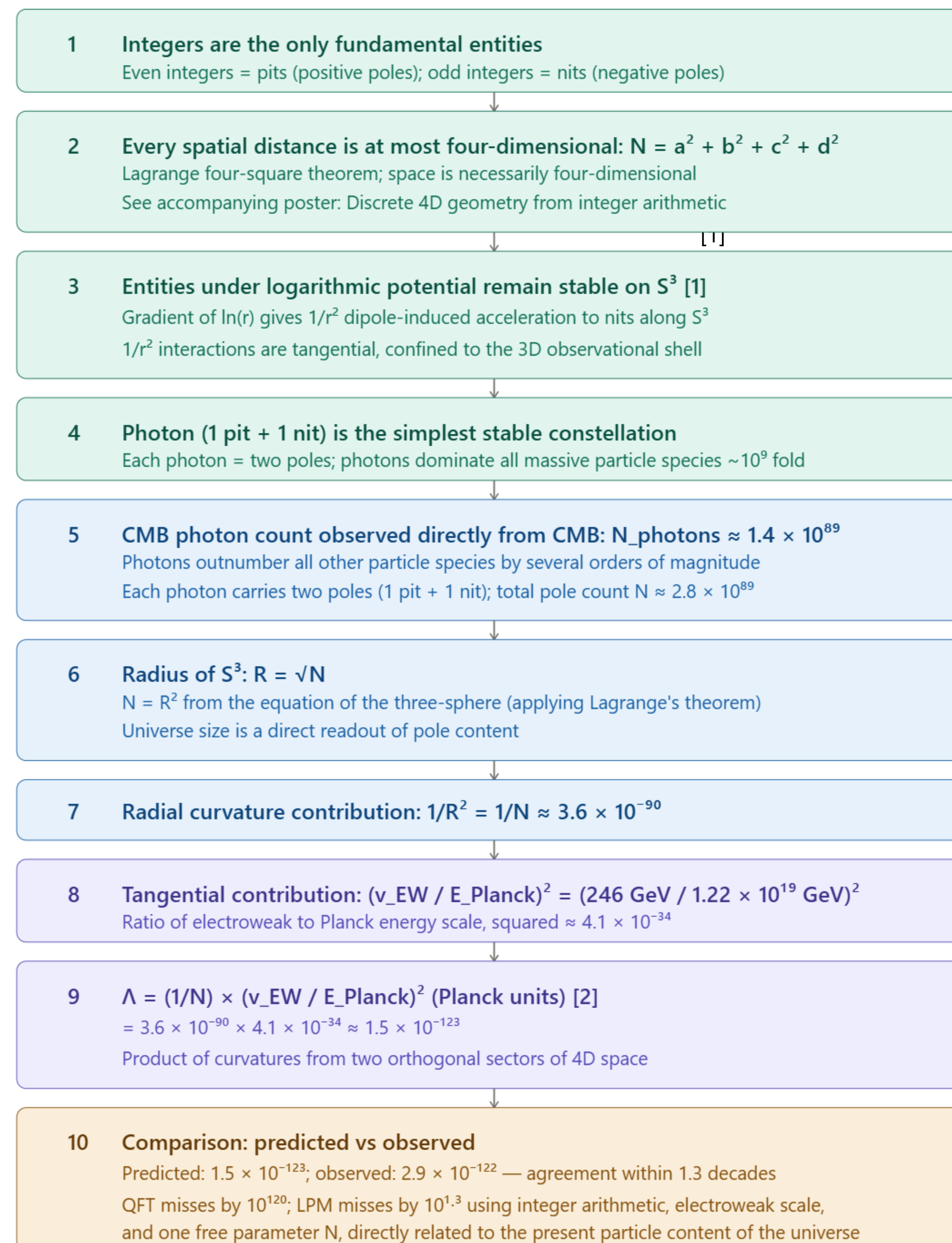
The tangential curvature, along the observable part of the 3D shell is based on the ratio of the electroweak scale to the Planck scale (see derivation \rightarrow)

The two contributions together produce the lambda to nearly within an order of magnitude across the 122 orders of magnitude.

Please **contact me** if you see opportunities for:

- a **seminar visit** to your university/institute to let me tell more about the Logarithmic Pole Model
- **doctorate thesis supervision** & an affiliation
- a **PhD thesis-work position** in Europe (I have readiness to relocate by the end of 2026)
- **co-publishing** of the present work and related results

Cosmological constant from integers — one free parameter



Teal = ontological foundations · Blue = cosmological setup · Purple = derivation · Amber = comparison

[1] E.A.T. Wosch, Trajectories in Logarithmic Potentials, arXiv:1009.0422

[2] P.G.O. Freund, M.A. Rubin, Dynamics of dimensional reduction, Phys. Lett. B 97 (1980) 233–235

Notes about the approach

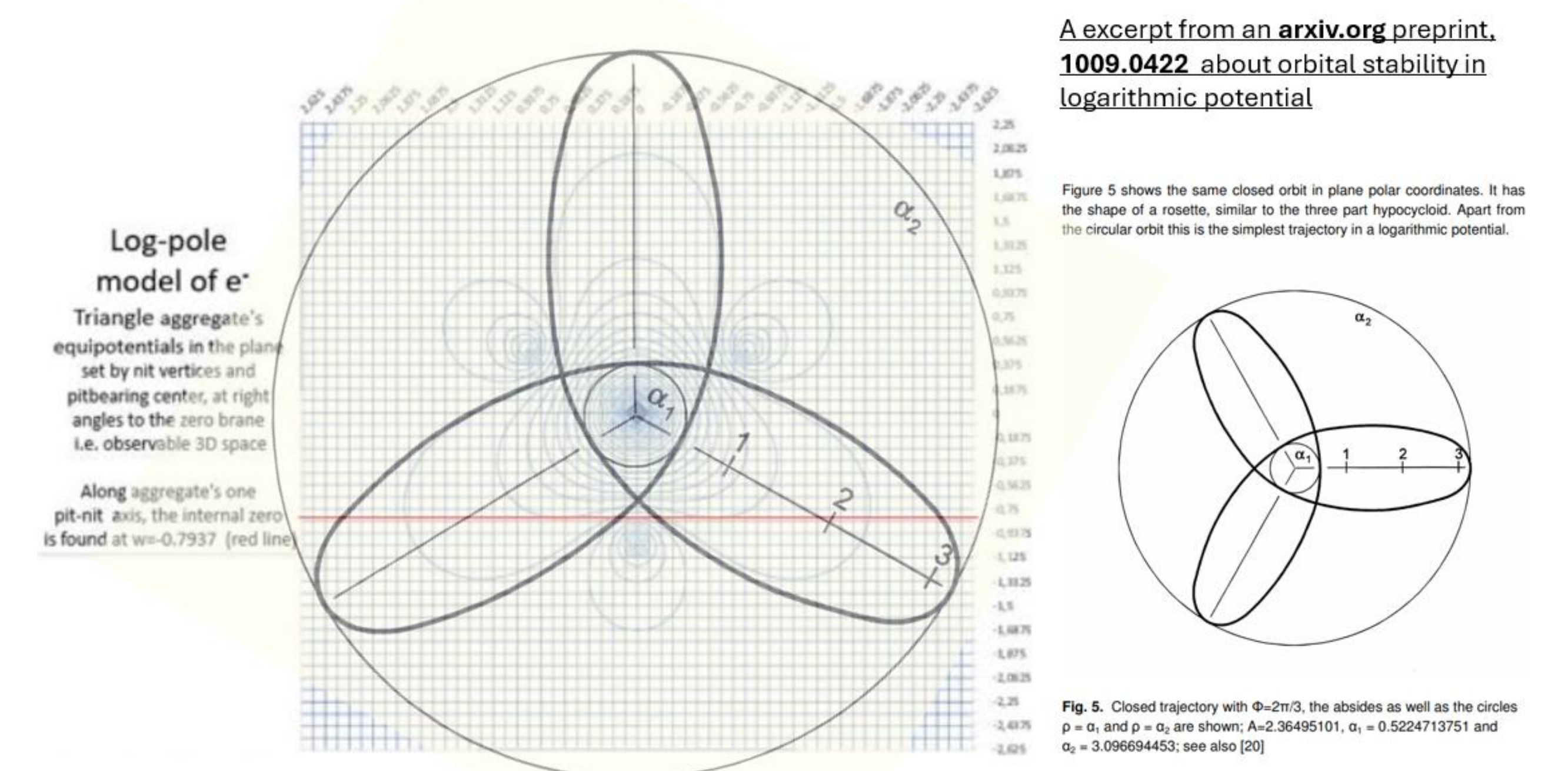
Multiplying curvature contributions from orthogonal submanifolds of a product space is standard procedure in dimensional reduction, established in the context of spontaneous compactification by Freund and Rubin [2].

The cosmological constant is the product of two independent geometric curvature contributions from orthogonal sectors embedded into 4D space: the radial S^3 curvature and the tangential electroweak-scale curvature in 3D (along 3-sphere).

Under Logarithmic Pole Model the radial sector arises from the integer arithmetic, the tangential one is based on a fundamental 3D length, the electroweak scale. I anticipate a paper under preparation that grounds the electroweak scale on the LPM pole composition of the Higgs boson — 6 pits and 7 nits — yielding the ratio of the electroweak scale to the Planck length from first principles.

Below: An example of the pole composition of a Standard Model particle.

To the right, a diagram of closed orbits under logarithmic potential from [1]; To the left, the orbit diagram superimposed on the equipotential diagram of an electron, composed of 3 pits and 3 nits into asymmetrical constellation by their reciprocal interactions as described in the Logarithmic Pole Model.



Upcoming presentations of Logarithmic Pole Model

Talk accepted to the Eighth Spacetime Conference, Albena, Bulgaria in September 2026. It includes, for example, a derivation of supernova 1987A neutrino signal from first principles under LPM, to within an order of magnitude across 58 orders in absolute scale.