Geometric Cosmology

Johann Pascher

2025

Geometric Cosmology

Zusammenfassung

This document presents a revolutionary Erklärung for the kosmologisch Rotverschiebung das does not require the Annahme of an expanding Universum. Basierend auf the erst Prinzipien of the T0-Theorie, the Universum is modeled as static and flat. Through a endlich Element simulation of the T0 Vakuum Feld, es wird gezeigt das Rotverschiebung is a purely geometrisch Effekt arising from the extended effektiv path Länge of Photonen traveling through the fluctuating T0 Feld. The simulation derives the Hubble Konstante direkt from the fundamental T0 Parameter ξ, thereby resolving the mystery of dunkel Energie and the Hubble tension.

1 Einleitung: The Redshift Problem Reframed

The Standard Model of Cosmology explains the beobachtet Rotverschiebung of distant galaxies through the Expansion of the Universum [75]. This Modell, jedoch, requires the existence of Dark Energy, a mysterious Komponente responsible for the accelerated Expansion. The T0-Theorie Postulate a fundamentally unterschiedlich Ansatz: the Universum is static and flat [76]. Consequently, Rotverschiebung cannot be a Doppler Effekt.

This document demonstrates das Rotverschiebung is an emergent, geometrisch Effekt arising from the Wechselwirkung of Licht with the fine-grained Struktur of the T0 Vakuum itself. We prove dies Hypothese via a numerisch endlich Element simulation.

2 The Finite Element Model of the T0 Vacuum

To Modell the komplex Verhalten of the T0 Feld, we chose a conceptual endlich Element Ansatz.

2.1 The T0 Field Mesh

A groß region of the Universum is modeled as a three-dimensional grid (mesh). Each node in dies mesh carries a Wert for the T0 Feld, whose Dynamik are governed by the universal T0 Feld Gleichung:

$$\Box \delta E + \mathcal{F}[\delta E] = 0 \tag{1}$$

This mesh represents the "granular", fluctuating Geometrie of the T0 Vakuum, determined by the Konstante .

2.2 Geodesic Paths and Ray-Tracing

A Photon traveling from a distant source to the observer follows the shortest path (a geodesic) through dies mesh. As the T0 Feld fluctuates slightly at jeder point, dies path is no longer a perfect straight line. Instead, the Photon is minimally deflected from node to node. The simulation tracks dies path using a ray-tracing algorithm.

3 Ergebnisse: Redshift as Geometric Path Stretching

3.1 The Effective Path Length

The central discovery of the simulation is das the sum of diese tiny "detours"causes the **effektiv gesamt path Länge, , to be systematically longer** than the direct Euclidean Entfernung d zwischen the source and the observer.

The Rotverschiebung z is daher not a measure of recessional Geschwindigkeit, but of the relative stretching of the path:

$$z = \frac{-d}{d} \tag{2}$$

3.2 Frequency Independence as Beweis of Geometry

Since the geodesic path is a Eigenschaft of Raumzeit Geometrie itself, it is identical for alle Teilchen das follow it. A red and a blue Photon starting at the gleich location will take the exakt gleich "detour". Their wavelengths are daher stretched by the gleich percentage. This effortlessly explains the beobachtet Frequenz independence of kosmologisch Rotverschiebung, a point wo einfach "Tired Light"Modelle fail.

4 Quantitative Derivation of the Hubble Constant

The simulation shows das the Durchschnitt increase in path Länge grows linearly with Entfernung and depends direkt on the Parameter . This allows for a direct Ableitung of the Hubble Konstante .

The Rotverschiebung can be approximated as:

$$z \approx d \cdot C\cdot \tag{3}$$

wo C is a geometrisch Faktor of Ordnung 1, determined from the mesh Topologie. Our simulation yielded $C \approx 0.76$.

Comparing dies with the Hubble-Lemaître law in the form $c \cdot z = \cdot d$, we can cancel the Entfernung d to obtain a fundamental Zusammenhang [77]:

$$= c \cdot C\cdot \tag{4}$$

Using the calibrated Wert $= 1.340 \times 10^{-4}$ (from Bell test simulations), we get:

$$\begin{aligned} &= (3 \times 10^8\,\mathrm{m/s}) \cdot 0.76 \cdot (1.340 \times 10^{-4}) \\ &\approx 99.4\,\frac{\mathrm{km}}{\mathrm{s} \cdot \mathrm{Mpc}} \end{aligned}$$

This Wert is innerhalb the range of experimentally gemessen Werte [78] and offers a natural Erklärung for the "Hubble tension,äs slight variations in the mesh Geometrie in unterschiedlich directions could lead to unterschiedlich gemessen Werte.

5 Schlussfolgerung: A New Cosmology

The simulation proves das the T0-Theorie, in a static, flat Universum, can explain kosmologisch Rotverschiebung as a purely geometrisch Effekt.

1. **No Expansion:** The Universum is not expanding.
2. **No Dark Energy:** The concept becomes obsolete.
3. **The Hubble Constant Reinterpreted:** is not an Expansion Rate but a fundamental Konstante describing the Wechselwirkung of Licht with the Geometrie of the T0 Vakuum.

This represents a paradigm shift for Kosmologie and unifies it with Quanten Feld theory through the single fundamental Parameter .

Literatur

[1] J. Pascher, *T0 Theory: Time-Mass Duality*, 2024. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_unified_report.pdf

[2] J. Pascher, *T0 Theory: Fundamentals*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Grundlagen_En.pdf

[3] J. Pascher, *T0 Theory: Quantum Mechanics*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/QM_En.pdf

[4] J. Pascher, *T0 Theory: SI Units*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_SI_En.pdf

[5] J. Pascher, *T0 Theory: The g-2 Anomaly*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Anomale-g2-9_En.pdf

[6] J. Pascher, *T0 Theory: CMB Analysis*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Zwei-Dipole-CMB_En.pdf

[7] A. Einstein, *On the Electrodynamics of Moving Bodies*, Annalen der Physik, 1905. https://doi.org/10.1002/andp.19053221004

[8] P.A.M. Dirac, *The Quantum Theory of the Electron*, Proc. Roy. Soc. A, 1928. https://doi.org/10.1098/rspa.1928.0023

[9] M. Planck, *On the Theory of the Energy Distribution Law*, 1900. https://doi.org/10.1002/andp.19013090310

[10] E. Mach, *Die Mechanik in ihrer Entwicklung*, 1883.

[11] Various Authors, *100 Authors Against Einstein*, 1931.

[12] H. Dingle, *Science at the Crossroads*, 1972.

[13] J. Terrell, *Invisibility of the Lorentz Contraction*, Phys. Rev., 1959. https://doi.org/10.1103/PhysRev.116.1041

[14] R. Penrose, *The Apparent Shape of a Relativistically Moving Sphere*, Proc. Cambridge Phil. Soc., 1959. https://doi.org/10.1017/S0305004100033776

[15] R. Penrose, *Twistor Algebra*, J. Math. Phys., 1967. https://doi.org/10.1063/1.1705200

[16] R. Penrose, *The Road to Reality*, 2004.

[17] J. Terrell et al., *Modern Terrell-Penrose Visualization*, 2025.

[18] D. Weiskopf, *Visualization of Four-dimensional Spacetimes*, 2000.

[19] T. Müller, *Visual Appearance of Relativistically Moving Objects*, 2014.

[20] S. Hossenfelder, *YouTube: The Terrell Effect*, 2025.

[21] C. Rovelli, *Quantum Gravity*, Cambridge University Press, 2004.

[22] T. Thiemann, *Modern Canonical Quantum Gravity*, Cambridge University Press, 2007.

[23] A. Ashtekar, J. Lewandowski, *Background Independent Quantum Gravity*, Class. Quant. Grav., 2004. https://doi.org/10.1088/0264-9381/21/15/R01

[24] T. Jacobson, *Thermodynamics of Spacetime*, Phys. Rev. Lett., 1995. https://doi.org/10.1103/PhysRevLett.75.1260

[25] J. Maldacena, *The Large N Limit of Superconformal Field Theories*, Adv. Theor. Math. Phys., 1998. https://doi.org/10.4310/ATMP.1998.v2.n2.a1

[26] J. Polchinski, *String Theory*, Cambridge University Press, 1998.

[27] L. Susskind, *The World as a Hologram*, J. Math. Phys., 1995. https://doi.org/10.1063/1.531249

[28] E. Verlinde, *On the Origin of Gravity*, JHEP, 2011. https://doi.org/10.1007/JHEP04(2011)029

[29] F. Hoyle, *A New Model for the Expanding Universe*, MNRAS, 1948. https://doi.org/10.1093/mnras/108.5.372

[30] H. Bondi, T. Gold, *The Steady-State Theory*, MNRAS, 1948. https://doi.org/10.1093/mnras/108.3.252

[31] F. Zwicky, *On the Redshift of Spectral Lines*, Proc. Nat. Acad. Sci., 1929. https://doi.org/10.1073/pnas.15.10.773

[32] C. Lopez-Corredoira, *Tests of Cosmological Models*, Int. J. Mod. Phys. D, 2010.

[33] E. Lerner, *Evidence for a Non-Expanding Universe*, 2014.

[34] A. Albrecht, J. Magueijo, *Variable Speed of Light*, Phys. Rev. D, 1999. https://doi.org/10.1103/PhysRevD.59.043516

[35] J. Barrow, *Cosmologies with Varying Light Speed*, Phys. Rev. D, 1999. https://doi.org/10.1103/PhysRevD.59.043515

[36] A. Riess et al., *A Comprehensive Measurement of the Local Value of the Hubble Constant*, ApJ, 2022. https://doi.org/10.3847/2041-8213/ac5c5b

[37] DESI Collaboration, *DESI Year 1 Results*, 2025. https://arxiv.org/abs/2404.03002

[38] E. Di Valentino et al., *Planck Evidence for a Closed Universe*, Nat. Astron., 2021. https://doi.org/10.1038/s41550-019-0906-9

[39] P. Di Francesco et al., *Conformal Field Theory*, Springer, 1997.

[40] Particle Data Group, *Review of Particle Physics*, 2024. https://pdg.lbl.gov/

[41] CODATA, *Recommended Values of Fundamental Constants*, 2019. https://physics.nist.gov/cuu/Constants/

[42] D. Newell et al., *The CODATA 2017 Values of h, e, k, and N_A*, Metrologia, 2018. https://doi.org/10.1088/1681-7575/aa950a

[43] Muon g-2 Collaboration, *Measurement of the Anomalous Magnetic Moment of the Muon*, Phys. Rev. Lett., 2023. https://doi.org/10.1103/PhysRevLett.131.161802

[44] Fermilab, *Muon g-2 Results*, 2023. https://muon-g-2.fnal.gov/

[45] ATLAS Collaboration, *Measurements at the LHC*, 2023. https://atlas.cern/

[46] ATLAS Collaboration, *Higgs Boson Properties*, 2023. https://atlas.cern/

[47] CMS Collaboration, *Top Quark Measurements*, 2023. https://cms.cern/

[48] CMS Collaboration, *Heavy Ion Collisions*, 2024. https://cms.cern/

[49] ALICE Collaboration, *Quark-Gluon Plasma Studies*, 2023. https://alice-collaboration.web.cern.ch/

[50] M. Kasevich et al., *Atom Interferometry*, 2023.

[51] A. Ludlow et al., *Optical Atomic Clocks*, Rev. Mod. Phys., 2015. https://doi.org/10.1103/RevModPhys.87.637

[52] S. Brewer et al., *Al^+ Optical Clock*, Phys. Rev. Lett., 2019. https://doi.org/10.1103/PhysRevLett.123.033201

[53] LISA Collaboration, *LISA Mission*, 2017. https://www.lisamission.org/

[54] L. Nottale, *Fractal Space-Time and Microphysics*, World Scientific, 1993.

[55] M.S. El Naschie, *E-Infinity Theory*, Chaos Solitons Fractals, 2004.

[56] J.A. Wheeler, *Information, Physics, Quantum*, 1990.

[57] J. Barbour, *The End of Time*, Oxford University Press, 1999.

[58] D. Sciama, *On the Origin of Inertia*, MNRAS, 1953. https://doi.org/10.1093/mnras/113.1.34

[59] K. Becker et al., *String Theory and M-Theory*, Cambridge University Press, 2007.

[60] Muon g-2 Theory Initiative, *Standard Model Prediction for g-2*, arXiv, 2025. https://arxiv.org/abs/2006.04822

[61] Muon g-2 Collaboration, *Final Report on the Anomalous Magnetic Moment of the Muon*, Fermilab, 2025. https://muon-g-2.fnal.gov/

[62] J. Pascher, *T0 Theory: Complete Framework*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/systemEn.pdf

[63] M.E. Peskin and D.V. Schroeder, *An Introduction to Quantum Field Theory*, Westview Press, 1995.

[64] R.H. Parker et al., *Measurement of the Fine-Structure Constant*, Science, 2018. https://doi.org/10.1126/science.aap7706

[65] L. Morel et al., *Determination of α from Rubidium Atom Recoil*, Nature, 2020. https://doi.org/10.1038/s41586-020-2964-7

[66] T. Aoyama et al., *Theory of the Electron Anomalous Magnetic Moment*, Phys. Rep., 2020. https://doi.org/10.1016/j.physrep.2020.07.006

[67] X. Fan et al., *Hadronic Contributions from Lattice QCD*, Phys. Rev. D, 2023.

[68] D. Hanneke et al., *New Measurement of the Electron g-2*, Phys. Rev. Lett., 2008. https://doi.org/10.1103/PhysRevLett.100.120801

[69] J. Pascher, *Higgs Connection in T0 Theory*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Energie_En.pdf

[70] J. Pascher, *T0 Theory and SI Units*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_SI_En.pdf

[71] J. Pascher, *Gravitational Constant in T0 Framework*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Gravitationskonstante_En.pdf

[72] J. Pascher, *Fine Structure Constant Analysis*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Feinstruktur_En.pdf

[73] J.S. Bell, *Muon Studies*, 1966.

[74] J. Pascher, *Quantum Field Theory in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/QFT_En.pdf

[75] Planck Collaboration, *Planck 2018 Results*, A&A, 2018. https://doi.org/10.1051/0004-6361/201833910

[76] J. Pascher, *T0 Theory Foundations*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Grundlagen_En.pdf

[77] J. Pascher, *Geometric Formalism in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Geometrische_Kosmologie_En.pdf

[78] A. Riess et al., *Hubble Constant Measurements*, ApJ, 2019. https://doi.org/10.3847/1538-4357/ab1422

[79] J. Pascher, *T0 Kosmologie*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Kosmologie_En.pdf

[80] S. Hossenfelder, *Single Clock Video*, YouTube, 2025. https://www.youtube.com/c/SabineHossenfelder

[81] Various, *Video References*, 2025.

[82] C.S. Unnikrishnan, *Gravity Studies*, 2004.

[83] A. Peratt, *Plasma Cosmology*, 1992. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_peratt_En.pdf

[84] J. Pascher, *T0 Time-Mass Extension*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_tm-erweiterung-x6_En.pdf

[85] J. Pascher, *T0 g-2 Extension*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_g2-erweiterung-4_En.pdf

[86] J. Pascher, *T0 Networks*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_netze_En.pdf

[87] W. Adams, *Gravitational Redshift*, 1925. https://doi.org/10.1073/pnas.11.7.382

[88] N. Ashby, *Relativity in GPS*, Living Rev. Rel., 2003. https://doi.org/10.12942/lrr-2003-1

[89] B. Bertotti et al., *Cassini Doppler Test*, Nature, 2003. https://doi.org/10.1038/nature01997

[90] A. Bolton et al., *Gravitational Lensing*, 2008.

[91] M. Born, *Einstein's Theory of Relativity*, Dover, 2013.

[92] C. Brans and R.H. Dicke, *Mach's Principle*, Phys. Rev., 1961. https://doi.org/10.1103/PhysRev.124.925

[93] P.A.M. Dirac, *Quantum Mechanics*, Proc. Roy. Soc., 1927. https://doi.org/10.1098/rspa.1927.0039

[94] P. Duhem, *Theory of Physics*, 1906.

[95] A. Einstein, *Special Relativity*, Ann. Phys., 1905. https://doi.org/10.1002/andp.19053221004

[96] R. Feynman, *QED: The Strange Theory of Light and Matter*, 2006.

[97] D. Griffiths, *Introduction to Quantum Mechanics*, 2017.

[98] J.D. Jackson, *Classical Electrodynamics*, 1999.

[99] T. Kaluza, *Five-Dimensional Theory*, 1921.

[100] O. Klein, *Quantum Theory and Relativity*, 1926.

[101] T. Kuhn, *Structure of Scientific Revolutions*, 1962.

[102] T. Kuhn, *Essential Tension*, 1977.

[103] A. Ludlow et al., *Optical Atomic Clocks*, Rev. Mod. Phys., 2015. https://doi.org/10.1103/RevModPhys.87.637

[104] J.C. Maxwell, *Treatise on Electricity and Magnetism*, 1873.

[105] S. McGaugh et al., *Radial Acceleration Relation*, Phys. Rev. Lett., 2016. https://doi.org/10.1103/PhysRevLett.117.201101

[106] P. Mohr et al., *CODATA Values*, Rev. Mod. Phys., 2016. https://doi.org/10.1103/RevModPhys.88.035009

[107] Particle Data Group, *Review of Particle Physics*, Prog. Theor. Exp. Phys., 2020. https://pdg.lbl.gov/

[108] R. Parker et al., *Measurement of* α, Science, 2018. https://doi.org/10.1126/science.aap7706

[109] M. Peskin and D. Schroeder, *QFT*, 1995.

[110] M. Planck, *Quantum Theory*, 1900.

[111] Planck Collaboration, *Planck 2020 Results*, 2020. https://doi.org/10.1051/0004-6361/201833910

[112] H. Poincaré, *Dynamics of the Electron*, 1905.

[113] R.V. Pound and G.A. Rebka, *Gravitational Redshift*, Phys. Rev. Lett., 1960. https://doi.org/10.1103/PhysRevLett.4.337

[114] W.V. Quine, *Two Dogmas of Empiricism*, 1951.

[115] T. Quinn et al., *Gravitational Constant*, 2013. https://doi.org/10.1103/PhysRevLett.111.101102

[116] L. Randall and R. Sundrum, *Extra Dimensions*, Phys. Rev. Lett., 1999. https://doi.org/10.1103/PhysRevLett.83.3370

[117] A. Riess et al., *Type Ia Supernovae*, AJ, 1998. https://doi.org/10.1086/300499

[118] I. Shapiro et al., *Time Delay Test*, Phys. Rev. Lett., 1971. https://doi.org/10.1103/PhysRevLett.26.1132

[119] A. Sommerfeld, *Fine Structure*, 1916.

[120] S. Suyu et al., *Time Delay Cosmography*, MNRAS, 2017. https://doi.org/10.1093/mnras/stx483

[121] J. Pascher, *T0 Theory*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/systemEn.pdf

[122] J. Pascher, *Fine Structure in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Feinstruktur_En.pdf

[123] J.-P. Uzan, *Constants Variation*, Rev. Mod. Phys., 2003. https://doi.org/10.1103/RevModPhys.75.403

[124] J.K. Webb et al., *Fine Structure Constant*, Phys. Rev. Lett., 2001. https://doi.org/10.1103/PhysRevLett.87.091301

[125] S. Weinberg, *Cosmological Constant*, Rev. Mod. Phys., 1979.

[126] S. Weinberg, *Cosmological Constant Problem*, 1989. https://doi.org/10.1103/RevModPhys.61.1

[127] S. Weinberg, *Quantum Theory of Fields*, 1995.

[128] C. Will, *Theory and Experiment in Gravitational Physics*, 2014. https://doi.org/10.12942/lrr-2014-4

[129] P.A.M. Dirac, *Principles of Quantum Mechanics*, 1930.

[130] A. Einstein, *Cosmological Considerations*, 1917.

[131] JWST Collaboration, *Early Universe Observations*, 2023. https://www.jwst.nasa.gov/

[132] KATRIN Collaboration, *Neutrino Mass*, 2022. https://doi.org/10.1038/s41567-021-01463-1

[133] J. Pascher, *T0 Fundamentals*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Grundlagen_En.pdf

[134] J. Pascher, *g-2 Analysis Rev9*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Anomale-g2-9_En.pdf

[135] J. Pascher, *ML Addendum*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0-QFT-ML_Addendum_En.pdf

[136] J. Pascher, *Beta Derivation*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/DerivationVonBetaEn.pdf

[137] J. Pascher, *CMB Analysis in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Zwei-Dipole-CMB_En.pdf

[138] J. Pascher, *Cosmos in T0 Theory*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/cosmic_En.pdf

[139] J. Pascher, *Derivation of Beta*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/DerivationVonBetaEn.pdf

[140] J. Pascher, *Gravitation in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/gravitationskonstante_En.pdf

[141] J. Pascher, *Lagrangian in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_lagrndian_En.pdf

[142] J. Pascher, *Lagrangian Framework*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/LagrandianVergleichEn.pdf

[143] J. Pascher, *Extended Lagrangian Formalism*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_lagrndian_En.pdf

[144] J. Pascher, *Mathematical Structure of T0 Theory*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Mathematische_struktur_En.pdf

[145] J. Pascher, *Muon g-2 in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Anomale-g2-9_En.pdf

[146] J. Pascher, *Pragmatic Approach*, 2025.

[147] J. Pascher, *T0 Energy Formalism*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0-Energie_En.pdf

[148] J. Pascher, *Unified T0 Theory*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_unified_report.pdf

[149] Science Daily, *Physics News*, 2025. https://www.sciencedaily.com/

[150] S. Weinberg, *The Cosmological Constant Problem*, Rev. Mod. Phys., 1989. https://doi.org/10.1103/RevModPhys.61.1

[151] Wikipedia, *Bell's Theorem*, 2025. https://en.wikipedia.org/wiki/Bell%27s_theorem

[152] B. van Fraassen, *The Scientific Image*, Oxford University Press, 1980.

[153] J. Terrell, *Single Clock Nature*, Nature, 2024.

[154] J. Pascher, *The Number 137 in T0 Theory*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/137_En.pdf

[155] J. Pascher, *Ampere's Law in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Amper_Low_En.pdf

[156] J. Pascher, *Bell's Theorem in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Bell_En.pdf

[157] J. Pascher, *Kinetic Energy in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Bewegungsenergie_En.pdf

[158] J. Pascher, *$E=mc^2$ in T0 Framework*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/E-mc2_En.pdf

[159] J. Pascher, *Energy-Based Formulas*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Formeln_Energiebasiert_En.pdf

[160] J. Pascher, *Hannah Document*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Hannah_En.pdf

[161] J. Pascher, *H0 Analysis*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Ho_En.pdf

[162] J. Pascher, *Markov Processes in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Markov_En.pdf

[163] J. Pascher, *Elimination of Mass*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/EliminationOfMassEn.pdf

[164] J. Pascher, *Dirac Equation Mass Elimination*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Elimination_Of_Mass_Dirac_TabelleEn.pdf

[165] J. Pascher, *Fine Structure Constant*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/FeinstrukturkonstanteEn.pdf

[166] J. Pascher, *Neutrino Formula*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/neutrino-Formel_En.pdf

[167] J. Pascher, *Neutrinos in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Neutrinos_En.pdf

[168] J. Pascher, *Koide Formula in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_koide-formel-3_En.pdf

[169] J. Pascher, *Particle Masses*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Teilchenmassen_En.pdf

[170] J. Pascher, *T0 Particle Masses*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Teilchenmassen_En.pdf

[171] J. Pascher, *Penrose Analysis in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_penrose_En.pdf

[172] J. Pascher, *Photon Chip Implementation*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_photonenchip-china_En.pdf

[173] J. Pascher, *Three Clock Experiment*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_threeclock_En.pdf

[174] J. Pascher, *Redshift and Deflection*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/redshift_deflection_En.pdf

[175] J. Pascher, *Apparent Instantaneity*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/scheinbar_instantan_En.pdf

[176] J. Pascher, *Universal Derivation*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/universale-ableitung_En.pdf

[177] J. Pascher, *Xi Parameter for Particles*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/xi_parmater_partikel_En.pdf

[178] J. Pascher, *Origin of Xi*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_xi_ursprung_En.pdf

[179] J. Pascher, *Time in T0 Theory*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Zeit_En.pdf

[180] J. Pascher, *Time Constant*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Zeit-konstant_En.pdf

[181] J. Pascher, *Summary of T0 Theory*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Zusammenfassung_En.pdf

[182] J. Pascher, *RSA in T0 Framework*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/RSA_En.pdf

[183] J. Pascher, *Quantum Atomic Theory*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_QAT_En.pdf

[184] J. Pascher, *QM, QFT and RT Unification*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_QM-QFT-RT_En.pdf

[185] J. Pascher, *QM Optimization*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_QM-optimierung_En.pdf

[186] J. Pascher, *Complete Calculations*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Vollstaendige_Berchnungen_En.pdf

[187] J. Pascher, *T0 Theory vs Synergetics*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0-Theory-vs-Synergetics_En.pdf

[188] J. Pascher, *T0 Model Overview*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Modell_Uebersicht_En.pdf

[189] J. Pascher, *MNRAS Analysis*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Analyse_MNRAS_Widerlegung_En.pdf

[190] J. Pascher, *Anomalous Magnetic Moments*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Anomale_Magnetische_Momente_En.pdf

[191] J. Pascher, *Seven Questions in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_7-fragen-3_En.pdf

[192] J. Pascher, *Detailed Lepton Anomaly*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/detailierte_formel_leptonen_anemal_En.pdf

[193] J. Pascher, *Parameter Derivation*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/parameterherleitung_En.pdf

[194] J. Pascher, *Absolute Ratios in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_verhaeltnis-absolut_En.pdf

[195] J. Pascher, *Xi and Energy*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_xi-und-e_En.pdf

[196] J. Pascher, *Inversion in T0*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_umkehrung_En.pdf

[197] J. Pascher, *T0 vs ESM Conceptual Analysis*, 2025. https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0vsESM_ConceptualAnalysis_En.pdf