

# Introduction to the T0-Theory

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# Capítulo 1

## T0-Theory: Fundamental Principles

## **Resumen**

This document introduces the fundamental principles of the T0-Theory, a geometric reformulation of physics based on a single universal parameter  $\xi = \frac{4}{3} \times 10^{-4}$ . The theory demonstrates how all fundamental constants and particle masses can be derived from the three-dimensional space geometry. Various interpretive approaches—harmonic, geometric, and field-theoretic—are presented on an equal footing. The fractal structure of quantum spacetime is systematically accounted for by the correction factor = 0,986.

## 1.1. Introduction to the T0-Theory

### 1.1.1. Time-Mass Duality

In natural units ( $\hbar = c = 1$ ), the fundamental relation holds:

$$T \cdot m = 1 \quad (1.1)$$

Time and mass are dual to each other: Heavy particles have short characteristic time scales, light particles long ones.

This duality is not merely a mathematical relation but reflects a fundamental property of spacetime. It explains why heavy particles couple more strongly to the temporal structure of spacetime.

### 1.1.2. The Central Hypothesis

The T0-Theory is based on the revolutionary hypothesis that all physical phenomena can be derived from the geometric structure of three-dimensional space. At its center is a single universal parameter:

## Foundation

### The Fundamental Geometric Parameter:

$$\xi = \frac{4}{3} \times 10^{-4} = 1,333333 \dots \times 10^{-4} \quad (1.2)$$

This parameter is dimensionless and contains all the information about the physical structure of the universe.

### 1.1.3. Paradigm Shift Compared to the Standard Model

Aspect	Standard Model	T0-Theory
Free Parameters	$> 20$	1
Theoretical Basis	Empirical Adjustment	Geometric Derivation
Particle Masses	Arbitrary	Computable from Quantum Numbers
Constants	Experimentally Determined	Geometrically Derived
Unification	Separate Theories	Unified Framework

Cuadro 1.1: Comparison between Standard Model and T0-Theory

## 1.2. The Geometric Parameter

### 1.2.1. Mathematical Structure

The parameter  $\xi$  consists of two fundamental components:

$$\xi = \underbrace{\frac{4}{3}}_{\text{Harmonic-geometric}} \times \underbrace{10^{-4}}_{\text{Scale Hierarchy}} \quad (1.3)$$

### 1.2.2. The Harmonic-Geometric Component: 4/3

#### Alternative

#### Harmonic Interpretation:

The factor  $\frac{4}{3}$  corresponds to the **perfect fourth**, one of the fundamental harmonic intervals:

- **Octave:** 2:1 (always universal)
- **Fifth:** 3:2 (always universal)
- **Fourth:** 4:3 (always universal!)

These ratios are **geometric/mathematical**, not material-dependent. Space itself has a harmonic structure, and 4/3 (the fourth) is its fundamental signature.

#### Alternative

#### Geometric Interpretation:

The factor  $\frac{4}{3}$  arises from the tetrahedral packing structure of three-dimensional space:

- **Tetrahedron Volume:**  $V = \frac{\sqrt{2}}{12}a^3$
- **Sphere Volume:**  $V = \frac{4\pi}{3}r^3$
- **Packing Density:**  $\eta = \frac{\pi}{3\sqrt{2}} \approx 0,74$
- **Geometric Ratio:**  $\frac{4}{3}$  from optimal space division

### 1.2.3. The Scale Hierarchy:

#### Foundation

##### Quantum Field Theoretic Derivation of $10^{-4}$ :

The factor  $10^{-4}$  arises from the combination of:

## 1. Loop Suppression (Quantum Field Theory):

$$\frac{1}{16\pi^3} = 2,01 \times 10^{-3} \quad (1.4)$$

## 2. T0-Higgs Parameter:

$$(\lambda_h^{(T0)})^2 \frac{(v^{(T0)})^2}{(m_h^{(T0)})^2} = 0,0647 \quad (1.5)$$

## 3. Complete Calculation:

$$2,01 \times 10^{-3} \times 0,0647 = 1,30 \times 10^{-4} \quad (1.6)$$

Thus: **QFT Loop Suppression** ( $\sim 10^{-3}$ )  $\times$  **T0 Higgs Sector** ( $\sim 10^{-1}$ ) =  $10^{-4}$

## 1.3. Fractal Spacetime Structure

### 1.3.1. Quantum Spacetime Effects

The T0-Theory recognizes that spacetime exhibits a fractal structure on Planck scales due to quantum fluctuations:

## Key Result

## Fractal Spacetime Parameters:

$$= 2,94 \quad (\text{effective fractal dimension}) \quad (1.7)$$

$$= 1 - \frac{-2}{68} = 1 - \frac{0,94}{68} = 0,986 \quad (1.8)$$

## Physical Interpretation:

- $< 3$ : Spacetime is “porous” on smallest scales
- $= 0,986 < 1$ : Reduced effective interaction strength
- The constant 68 arises from the tetrahedral symmetry of 3D space
- Quantum fluctuations and vacuum structure effects

### 1.3.2. Origin of the Constant 68

#### Alternative

#### Tetrahedron Geometry:

All tetrahedron combinations yield 72:

$$6 \times 12 = 72 \quad (\text{edges} \times \text{rotations}) \quad (1.9)$$

$$4 \times 18 = 72 \quad (\text{faces} \times 18) \quad (1.10)$$

$$24 \times 3 = 72 \quad (\text{symmetries} \times \text{dimensions}) \quad (1.11)$$

The value  $68 = 72 - 4$  accounts for the 4 vertices of the tetrahedron as exceptions.

## 1.4. Characteristic Energy Scales

### 1.4.1. The T0 Energy Hierarchy

From the parameter  $\xi$ , natural energy scales emerge:

$$(E_0)_\xi = \frac{1}{\xi} = 7500 \quad (\text{in natural units}) \quad (1.12)$$

$$(E_0)_{\text{EM}} = 7,398 \text{ MeV} \quad (\text{characteristic EM energy}) \quad (1.13)$$

$$(E_0)_{\text{char}} = 28,4 \quad (\text{characteristic T0 energy}) \quad (1.14)$$

### 1.4.2. The Characteristic Electromagnetic Energy

#### Key Result

#### Gravitational-Geometric Derivation of $E_0$ :

The characteristic energy follows from the coupling relation:

$$E_0^2 = \frac{4\sqrt{2} \cdot m_\mu}{\xi^4} \quad (1.15)$$

This yields  $E_0 = 7,398 \text{ MeV}$  as the fundamental electromagnetic energy scale.

#### Alternative

#### Geometric Mean of Lepton Masses:

Alternatively,  $E_0$  can be defined as the geometric mean:

$$E_0 = \sqrt{m_e \cdot m_\mu} = 7,35 \text{ MeV} \quad (1.16)$$

The difference from  $7.398 \text{ MeV}$  ( $< 1 \%$ ) is explainable by quantum corrections.

## 1.5. Dimensional Analytic Foundations

### 1.5.1. Natural Units

The T0-Theory works in natural units, where:

$$\hbar = c = 1 \quad (\text{convention}) \quad (1.17)$$

In this system, all quantities have energy dimension or are dimensionless:

$$[M] = [E] \quad (\text{from } E = mc^2 \text{ with } c = 1) \quad (1.18)$$

$$[L] = [E^{-1}] \quad (\text{from } \lambda = \hbar/p \text{ with } \hbar = 1) \quad (1.19)$$

$$[T] = [E^{-1}] \quad (\text{from } \omega = E/\hbar \text{ with } \hbar = 1) \quad (1.20)$$

### 1.5.2. Conversion Factors

#### Warning

#### Critical Importance of Conversion Factors:

For experimental comparison, conversion factors from natural to SI units are essential:

- These are **not** arbitrary but follow from fundamental constants
- They encode the connection between geometric theory and measurable quantities
- Example:  $C_{\text{conv}} = 7,783 \times 10^{-3}$  for the gravitational constant  $G$  in  $\frac{\text{m}^3}{\text{kg}^3 \text{s}^2}$

## 1.6. The Universal T0 Formula Structure

### 1.6.1. Basic Pattern of T0 Relations

All T0 formulas follow the universal pattern:

$$\boxed{\text{Physical Quantity} = f(\xi, \text{Quantum Numbers}) \times \text{Conversion Factor}} \quad (1.21)$$

where:

- $f(\xi, \text{Quantum Numbers})$  encodes the geometric relation
- Quantum numbers  $(n, l, j)$  determine the specific configuration
- Conversion factors establish the connection to SI units



### 1.6.2. Examples of the Universal Structure

$$\text{Gravitational Constant: } G = \frac{\xi^2}{4m_e} \times C_{\text{conv}} \times \quad (1.22)$$

$$\text{Particle Masses: } m_i = \frac{1}{\xi \cdot f(n_i, l_i, j_i)} \times C_{\text{conv}} \quad (1.23)$$

$$\text{Fine Structure Constant: } \alpha = \xi \times \left( \frac{E_0}{1 \text{ MeV}} \right)^2 \quad (1.24)$$

## 1.7. Various Levels of Interpretation

### 1.7.1. Hierarchy of Levels of Understanding

#### Foundation

The T0-Theory can be understood on various levels:

#### 1. Phenomenological Level:

- Empirical Observation: One constant explains everything
- Practical Application: Prediction of new values

#### 2. Geometric Level:

- Space structure determines physical properties
- Tetrahedral packing as basic principle

#### 3. Harmonic Level:

- Spacetime as a harmonic system
- Particles as “tones” in cosmic harmony

#### 4. Quantum Field Theoretic Level:

- Loop suppressions and Higgs mechanism
- Fractal corrections as quantum effects

### 1.7.2. Complementary Perspectives

#### Alternative

#### Reductionist vs. Holistic Perspective:

##### Reductionist:

- $\xi$  as an empirical parameter that “accidentally” works
- Geometric interpretations as added post hoc

##### Holistic:

- Space-Time-Matter as inseparable unity
- $\xi$  as expression of a deeper cosmic order

## 1.8. Basic Calculation Methods

### 1.8.1. Direct Geometric Method

The simplest application of the T0-Theory uses direct geometric relations:

$$\text{Physical Quantity} = \text{Geometric Factor} \times \xi^n \times \text{Normalization} \quad (1.25)$$

where the exponent  $n$  follows from dimensional analysis and the geometric factor contains rational numbers like  $\frac{4}{3}$ ,  $\frac{16}{5}$ , etc.

### 1.8.2. Extended Yukawa Method

For particle masses, the Higgs mechanism is additionally considered:

$$m_i = y_i \cdot v \quad (1.26)$$

where the Yukawa couplings  $y_i$  are geometrically calculated from the T0 structure:

$$y_i = r_i \times \xi^{p_i} \quad (1.27)$$

The parameters  $r_i$  and  $p_i$  are exact rational numbers that follow from the quantum number assignment of the T0 geometry.

## 1.9. Philosophical Implications

### 1.9.1. The Problem of Naturalness

#### Foundation

### Why is the Universe Mathematically Describable?

The T0-Theory offers a possible answer: The universe is mathematically describable because it is **itself** mathematically structured. The parameter  $\xi$  is not just a description of nature—it **is** nature.

- **Platonic Perspective:** Mathematical structures are fundamental
- **Pythagorean Perspective:** “Everything is number and harmony”
- **Modern Interpretation:** Geometry as the basis of physics

### 1.9.2. The Anthropic Principle

#### Alternative

### Weak vs. Strong Anthropic Principle:

#### Weak (observation-dependent):

- We observe  $\xi = \frac{4}{3} \times 10^{-4}$  because only in such a universe can observers exist
- Multiverse with different  $\xi$  values

#### Strong (principled):

- $\xi$  has this value **because** it follows from the logic of spacetime
- Only this value is mathematically consistent

## 1.10. Experimental Confirmation

### 1.10.1. Successful Predictions

The T0-Theory has already passed several experimental tests.

### 1.10.2. Testable Predictions

#### Key Result

The theory makes specific, falsifiable predictions:

1. Neutrino Mass:  $m_\nu = 4,54 \text{ meV}$  (geometric prediction)
2. Tau Anomaly:  $\Delta a_\tau = 7,1 \times 10^{-9}$  (not yet measurable)
3. Modified Gravity at Characteristic T0 Length Scales
4. Alternative Cosmological Parameters without Dark Energy

## 1.11. Summary and Outlook

### 1.11.1. The Central Insights

#### Foundation

#### Fundamental T0 Principles:

1. **Geometric Unity:** One parameter  $\xi = \frac{4}{3} \times 10^{-4}$  determines all physics
2. **Fractal Structure:** Quantum spacetime with  $D_f = 2,94$  and  $K_{\text{frak}} = 0,986$
3. **Harmonic Order:**  $4/3$  as fundamental harmonic ratio
4. **Hierarchical Scales:** From Planck to cosmological dimensions
5. **Experimental Testability:** Concrete, falsifiable predictions

### 1.11.2. The Next Steps

This first document of the T0 Series has established the fundamental principles. The following documents will deepen these foundations in specific applications.

## 1.12. Structure of the T0 Document Series

This foundational document forms the starting point for a systematic presentation of the T0-Theory. The following documents deepen specific aspects:

- **T0\_FineStructure\_En.tex:** Mathematical Derivation of the Fine Structure Constant
- **T0\_GravitationalConstant\_En.tex:** Detailed Calculation of Gravity
- **T0\_ParticleMasses\_En.tex:** Systematic Mass Calculation of All Fermions
- **T0\_Neutrinos\_En.tex:** Special Treatment of Neutrino Physics
- **T0\_AnomalousMagneticMoments\_En.tex:** Solution to the Muon g-2 Anomaly
- **T0\_Cosmology\_En.tex:** Cosmological Applications of the T0-Theory

- **T0\_QM-QFT-RT\_En.tex**: Complete Quantum Field Theory in the T0 Framework with Quantum Mechanics and Quantum Computing Applications

Each document builds on the principles established here and demonstrates their application in a specific area of physics.

## 1.13. References

### 1.13.1. Fundamental T0 Documents

1. Pascher, J. (2025). *T0-Theory: Derivation of the Gravitational Constant*. Technical Documentation.
2. Pascher, J. (2025). *T0-Model: Parameter-Free Particle Mass Calculation with Fractal Corrections*. Scientific Treatise.
3. Pascher, J. (2025). *T0-Model: Unified Neutrino Formula Structure*. Special Analysis.

### 1.13.2. Related Works

1. Einstein, A. (1915). *The Field Equations of Gravitation*. Proceedings of the Royal Prussian Academy of Sciences.
2. Planck, M. (1900). *On the Theory of the Law of Energy Distribution in the Normal Spectrum*. Proceedings of the German Physical Society.
3. Wheeler, J.A. (1989). *Information, Physics, Quantum: The Search for Links*. Proceedings of the 3rd International Symposium on Foundations of Quantum Mechanics.

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*This document is part of the new T0 Series  
and replaces the older, inconsistent presentations*

## T0-Theory: Time-Mass Duality Framework

# Bibliografía

- [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](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](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](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](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](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](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](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  $\alpha$  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](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](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](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](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](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](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](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](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](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](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](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](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  $\alpha$* , 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,  *$T_0$  Theory*, 2025. <https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/systemEn.pdf>
- [122] J. Pascher, *Fine Structure in  $T_0$* , 2025. [https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0\\_Feinstruktur\\_En.pdf](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](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](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](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](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](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](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](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/LagrangianVergleichEn.pdf>

- [143] J. Pascher, *Extended Lagrangian Formalism*, 2025. [https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0\\_lagrndian\\_En.pdf](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](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](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](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](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](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](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](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](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](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](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](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](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](https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Ho_En.pdf)

- [162] J. Pascher, *Markov Processes in  $T_0$* , 2025. [https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Markov\\_En.pdf](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](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](https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/neutrino-Formel_En.pdf)
- [167] J. Pascher, *Neutrinos in  $T_0$* , 2025. [https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0\\_Neutrinos\\_En.pdf](https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Neutrinos_En.pdf)
- [168] J. Pascher, *Koide Formula in  $T_0$* , 2025. [https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0\\_koide-formel-3\\_En.pdf](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](https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Teilchenmassen_En.pdf)
- [170] J. Pascher,  *$T_0$  Particle Masses*, 2025. [https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0\\_Teilchenmassen\\_En.pdf](https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_Teilchenmassen_En.pdf)
- [171] J. Pascher, *Penrose Analysis in  $T_0$* , 2025. [https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0\\_penrose\\_En.pdf](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](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](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](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](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](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](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](https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0_xi_ursprung_En.pdf)
- [179] J. Pascher, *Time in  $T_0$  Theory*, 2025. [https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/Zeit\\_En.pdf](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](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](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](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](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](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](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](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](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](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](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](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](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/detaillierte\\_formel\\_leptonen\\_anomal\\_En.pdf](https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/detaillierte_formel_leptonen_anomal_En.pdf)
- [193] J. Pascher, *Parameter Derivation*, 2025. [https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/parameterherleitung\\_En.pdf](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](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](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](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](https://github.com/jpascher/T0-Time-Mass-Duality/blob/main/2/pdf/T0vsESM_ConceptualAnalysis_En.pdf)