

# 3D+3D Discrete Spacetime Framework

Complete Repository Guide -- Version 6.0

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## 1. START HERE

If you are reading this repository for the first time, begin with these two consolidated papers:

**Paper A** -- *Geometric Dark Energy and Baryogenesis from Temporal Compactification in Six-Dimensional Discrete Spacetime* (23 pages). Derives  $w_0 = -0.80$  from 6D geometry, unifies dark energy, baryogenesis, and strong CP.

File: [Paper\\_A\\_Dark\\_Energy\\_Baryogenesis\\_v1\\_0.pdf](#)

**Paper B** -- *Mathematical Completeness and Ultraviolet Safety of the 3D+3D Discrete Spacetime Framework* (19 pages). Proves well-posedness, counts 6 physical DOF, establishes UV fixed point at NNLO.

File: [Paper\\_B\\_Mathematical\\_Completeness\\_UV\\_Safety\\_v1\\_0.pdf](#)

**Clarification Note** -- Parameter Registry. Single source of truth for all canonical parameters.

File: [Clarification\\_Note\\_Parameter\\_Registry\\_v1\\_0.md.pdf](#)

## 2. KEY PREDICTIONS (Pre-Registered)

These predictions are falsifiable. A robust determination of  $w_0 < -1$  (phantom crossing) would definitively exclude this framework.

**The Five Kill Switches:**

Kill Switch	Prediction	Experiment	Year
<b>KS1</b>	$w_0 = -0.80 \pm 0.05$	DESI + Euclid	2026
<b>KS2</b>	$\gamma = 0.567 \pm 0.02$	DESI	2026
<b>KS3</b>	$\text{Sum}(m_\nu) \sim 60 \text{ meV}$	KATRIN	2027
<b>KS4</b>	$\sin^2(\theta_{23}) = \phi/3$	DUNE	2028
<b>KS5</b>	No WIMP detection	LZ / XENONnT	2026

**Additional pre-registered predictions:**

Prediction	Value	Test	Timeline
$w_0 \geq -1$ (structural)	Never phantom	Euclid + DESI	2026-2027
$\lambda_{13}$	0.856 Mpc	Euclid DR1	2026
$w_a$	+0.98	DESI Year 5	2028
$T_2 = 30 \text{ yr beat}$	NANOGrav	20yr dataset	2028

## 3. REPOSITORY STRUCTURE

Total size: ~70 MB. License: CC BY 4.0. The full derivation chain of 65+ papers (~1000 pages) organized in 15 thematic volumes plus reference documents.

### Group 1: Thematic Archives

- [01\\_FOUNDATIONS\\_CORE.7z](#) (3.6 MB) -- Papers I-IV: axioms, KK reduction, Q-fields, screening, 4D Lagrangian
- [02\\_GALACTIC\\_DYNAMICS.7z](#) (4.0 MB) -- SPARC (175 galaxies), WALLABY, HALOGAS, NGC 3198, dSphs, Sgr A\*, subcritical response, mass-size relation
- [03\\_COSMOLOGY\\_LARGE\\_SCALE.7z](#) (6.5 MB) -- Cosmic web, Euclid predictions, unified cosmology, N-body simulations (Gadget4 + cosmological)
- [04\\_PARTICLE\\_PHYSICS\\_SM.7z](#) (3.2 MB) -- 42 SM parameters, fermion masses, mixing matrices, Dirac 6D sector selection, gluon amplitudes, EM vertex
- [05\\_MATHEMATICAL\\_THEOREMS.7z](#) (2.5 MB) -- Uniqueness, completeness, stability, topology, bridge dual derivation, NNLO convergence, CMP summary
- [06\\_ADVANCED\\_TOPICS.7z](#) (15.4 MB) -- Black holes, chronology, thermodynamics, entanglement, BH radial profiles, SMBH primordial, GW multiband, FRB dispersion, AGN outflows
- [07\\_UV\\_COMPLETION\\_QFT.7z](#) (2.2 MB) -- Asymptotic safety, NNLO, regulator independence, Hamiltonian-Dirac analysis, well-posedness, constraint independence
- [08\\_GAMMA\\_RAY\\_ASTROPHYSICS.7z](#) (763 kB) -- Galactic center, dwarf spheroidals
- [09\\_SUPPLEMENTARY\\_MATERIALS.7z](#) (1.3 MB) -- Errata, parameter tables, cross-references
- [10\\_HIGH\\_REDSHIFT\\_VALIDATIONS.7z](#) (673 kB) -- JWST high-z, AGN outflows, FRB
- [11\\_LAST\\_GAP\\_SOLVED.7z](#) (1.1 MB) -- Final closure papers, Lagrangian completeness
- [12\\_DARK\\_ENERGY.7z](#) (782 kB) -- Dark energy derivations, model reconciliation, definitive DE predictions
- [13\\_GER.7z](#) (902 kB) -- Geometric Evolutionary Ratios: GER I-IV, quasicrystals, predictive validation, Red Team verification
- [14\\_ATOMIC\\_PHYSICS.7z](#) (~1.5 MB) -- Atomic physics master, Coulomb coupling, dimensional reduction, mode selection, QED form factor, known limitations
- [15\\_FOUNDATIONS\\_AXIOMS.7z](#) (~1.5 MB) --  $\tau = i/\phi$  derivation, Fingerprint No-Go theorem, Parameter Regress Theorem, speed of light from 6D, convergent derivations of 42 parameters

### Group 2: Consolidated Papers (entry points)

- [Paper\\_A\\_Dark\\_Energy\\_Baryogenesis\\_v1\\_0.pdf](#) (23 pp) -- DE + baryogenesis + strong CP
- [Paper\\_B\\_Mathematical\\_Completeness\\_UV\\_Safety\\_v1\\_0.pdf](#) (19 pp) -- Well-posedness + DOF + UV

### Group 3: Reference Documents

- [README\\_3D3D\\_Zenodo\\_v6\\_0.md.pdf](#) -- This file (navigation map)
- [Clarification\\_Note\\_Parameter\\_Registry\\_v1\\_0.md.pdf](#) -- Single source of truth
- [Master\\_Mathematical\\_Structure\\_3D3D\\_v4\\_.md.pdf](#) -- Complete structure map
- [Symbol\\_Book\\_3D3D\\_EN.pdf](#) -- Notation glossary (~200 symbols)

### Group 4: Independent Papers

These contain unique results NOT consolidated into Paper A or B and remain as individual PDFs:

- Sagittarius A and the Dark Matter Paradigm (Sgr A\*)
- Primordial Supermassive Black Hole Formation (SMBH seeds)
- Discrete Velocity Structure in AGN Outflows (breathing modes)
- Paper\_Fingerprint\_NoGo (no-go theorem)
- Paper\_FRB\_Dispersion\_3D3D (Fast Radio Burst)

- Paper\_BH\_Radial\_Profile-Decompactification (BH profiles)
- Paper\_GW\_Complete\_MultiBand\_6D (gravitational waves)
- Paper\_Speed\_of\_Light\_6D\_Origin (c from 6D)
- Paper\_XLV\_B\_Dirac\_6D (fermions, matter-antimatter)
- Paper\_Subcritical\_Response\_3D3D (subcritical galaxies)
- Paper\_Mass\_Size\_Golden\_Ratio (mass-size relation)
- Paper\_Dark\_Energy\_Model\_Reconciliation (DE comparison)
- Paper\_Electron\_Mass\_6D\_Direct (electron mass from geometry)
- Paper\_Mathematical\_Core\_CMP\_Style (CMP summary)
- Paper\_Growth\_Rate\_6D\_v2\_0\_DEFINITIVE ( $\gamma = 0.567$ )

## Group 5: Computational Scripts

- [SCRIPT.7z](#) -- Analysis scripts (SPARC fitting, screening solver, TTN Navigator)
- [sim\\_3d3d\\_cosmo\\_v2.py](#) -- Cosmological simulation (CURRENT)
- [DiskMode\\_Hierarchy\\_Zenodo\\_Package.zip](#) -- Disk mode analysis

4. SUPERSEDED FILES

These files have newer versions or are consolidated into Paper A/B. They remain for historical traceability but should NOT be used as primary references.

Superseded by Paper A:

- Errata\_Dark\_Energy\_Sector\_v1\_1.pdf (now Paper A, Part I)

Superseded by Paper B:

- Paper\_Well\_Posedness\_Physical\_Sector (now Paper B, Part I)
- Paper\_Canonical\_Hamiltonian\_Dirac\_Analysis (now Paper B, Part II)
- Paper\_NNLO\_Convergence\_Truncation\_Independence (now Paper B, Part III)
- Paper\_Constraint\_Independence\_Analysis (now Paper B, Part IV)

Superseded by newer version:

- Paper\_GER\_II\_v2\_Rigorous.pdf (use v3 instead)
- sim\_3d3d\_cosmo\_v1.py (use v2 instead)

5. READING PATHS

Path	Audience	Time	Reading Order
A	Theorist	4 weeks	Wk1: Paper A+B. Wk2: 01_FOUNDATIONS + 15_AXIOMS. Wk3: 05_MATH + 07_UV. Wk4: 04_F
B	Observer	2 weeks	Wk1: Paper A + 02_GALACTIC. Wk2: 03_COSMOLOGY + 10_HIGH_REDSHIFT.
C	Referee	3 days	Day 1: Paper B (rigor). Day 2: Paper A (predictions). Day 3: Clarification Note.
D	Overview	2 hours	Paper A abstract + Sec 4-5. Paper B abstract + Sec 2,9,17. Predictions table.
E	Atomic	1 week	14_ATOMIC: Master paper first, then Coulomb, Dimensional Reduction, QED Form Factor.

6. THEORY SUMMARY

**Core idea:** Spacetime has 6 dimensions with signature  $(-,+,+,+,-,-)$ . Two extra temporal dimensions are compactified on a torus  $T^2$  at  $\sim 10$  light-years. The compactification produces scalar fields  $(Q_2, Q_3)$  that modify gravity at galactic scales, explaining dark matter as a geometric effect. The modular parameter of  $T^2$  is fixed by spacetime symmetry:  $\tau = i/\phi$  ( $\phi$  = golden ratio).

Parameter	Symbol	Value
Signature	$(-,+,+,+,-,-)$	6D with 3 temporal
Compactification radii	$L_2, L_3$	9.5 ly, 6.0 ly
Oscillation periods	$T_2, T_3$	30 yr, 19 yr
Critical mass	$M_{\text{crit}}$	$2.43 \times 10^{10} M_{\text{sun}}$
Dark energy EoS	$w_0$	-0.80
Geometric CP violation	$\epsilon_{\text{CP}}$	-0.76
Baryon asymmetry	$\eta_B$	$6 \times 10^{-10}$
Physical DOF	$n_{\text{DOF}}$	6
Modular parameter	$\tau$	$i / \phi$
Breathing velocity	$v_{\text{3D3D}}$	90.48 km/s
SM parameters derived	$N_{\text{param}}$	42 (1.2% avg error)

Growth rate	gamma	0.567
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**Definitive exclusion if:**  $w_0 < -1$  robustly measured (phantom crossing), OR dark matter particle directly detected, OR  $\lambda_{13}$  differs from 0.856 Mpc at  $> 5$  sigma, OR 3+ of 15 pre-registered predictions fail at  $> 3$  sigma.

## 7. DETAILED ARCHIVE CONTENTS

### 15\_FOUNDATIONS\_AXIOMS.7z (NEW in v6.0)

- The Modular Parameter  $\tau = i\phi$ : Complete Derivation from 6D Spacetime Symmetry
- Paper\_Fingerprint\_NoGo (uniqueness: only 3D+3D satisfies all constraints)
- Paper\_Irreducible\_Parameter\_Count\_4D (Parameter Regress Theorem: 4D needs  $\geq 19$  free params)
- Paper\_Speed\_of\_Light\_6D-Origin ( $c$  derived from compactification geometry)
- Convergent Derivations of 42 SM Parameters: Spectral + Geometric from  $\tau = i\phi$

### 13\_GER.7z (Geometric Evolutionary Ratios)

- Paper\_GER\_I\_Introduction
- Paper\_GER\_II\_v3\_Complete\_Derivation (CURRENT)
- Paper\_GER\_III\_Quasicrystals
- Paper\_GER\_IV\_Complete
- Paper\_GER\_Appendix\_D\_Quantitative
- Paper\_GER\_Predictive\_Validation
- Paper\_GER\_RedTeam\_Verification

### 14\_ATOMIC\_PHYSICS.7z

- Paper\_Atomic\_Physics\_Master (start here)
- Paper\_Atomic\_Coulomb\_Coupling
- Paper\_Atomic\_Dimensional\_Reduction
- Paper\_Atomic\_Mode\_Selection
- Paper\_Atomic\_QED\_Form\_Factor
- Paper\_Atomic\_Known\_Limitations

## 8. VERSION HISTORY

Ver	Date	Changes
v1.0	Oct 2025	Initial upload, Papers I-XXII
v2.0	Nov 2025	Papers XXIII-XL, scripts
v3.0	Dec 2025	GER series, atomic series, 11 archives
v4.0	Jan 2026	High-redshift, N-body, GW papers
v5.0	Feb 2026	Paper A + Paper B consolidation
v6.0	Feb 2026	15 thematic archives. Added 15_FOUNDATIONS_AXIOMS, 14_ATOMIC_PHYSICS. Updated $w_0=-0.80$ . 5 Kil

## 9. CONTACT

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We welcome criticism, corrections, and falsification attempts.

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*Non facciamo le cose a meta!*

Theory origin: September 14, 2025 -- A human intuition on discrete mathematics and 3D space