Maat Field Theory of Everything (MFToE)
A Dynamical Unification of Ethics and Physics

Christof Krieg
*Independent Researcher**

The Maat Field Theory of Everything (MFToE) extends the original ToE_Maat framework into a fully dynamical field theory. Five ethical principles—Harmony, Balance, Creativity, Connectedness, and Respect—are represented as scalar fields coupled through a potential that enforces the Maat World Formula in equilibrium. The theory unifies ethical and physical structures within a single Lagrangian, enabling the use of established tools from theoretical physics to model evolution, interaction, and observability of ethical states in physical and cosmological systems. Numerical illustrations show dark-energy–like behavior ($w_\phi \to -1$) consistent with Planck-consistent behavior. We further interpret the five Maat fields as universal ethical–physical coordinates linking resonance, balance, creativity, interconnection, and conservation.

I. INTRODUCTION

The pursuit of a unified description of the universe has traditionally aimed to reconcile the fundamental forces of nature into a single, coherent framework. Yet one dimension of existence has remained absent from this quest: the informational and ethical architecture underlying stable, self-organizing systems. The Maat Field Theory of Everything (MFToE) proposes that what we call ethics—principles such as harmony, balance, creativity, connectedness, and respect—are not merely human values, but universal organizing tendencies embedded in the informational substrate of reality itself.[1]

In this view, physical law and ethical order emerge from a common foundation: the self-consistent evolution of systems toward maximal coherence. Just as the Einstein field equations describe spacetime's response to energy and momentum, the Maat framework describes how informational and energetic systems evolve toward equi- librium through the interplay of five scalar "ethical fields" $\Phi_{H,B,S,V,R}$. Each field represents a structural quality of stability and transformation: Φ_H (harmony) promotes coherence; Φ_B (balance) maintains equilibrium; Φ_S (creativity) enables innovation; Φ_V (connectedness) sustains interaction; and Φ_R (respect) imposes natural limits and conservation. Together they form a minimal, complete basis for describing the dynamics of sustainable complexity.

From this perspective, ethics is not an external prescription, but an emergent property of physical reality—a pattern of order that minimizes informational entropy across scales. The MFToE formulates this idea mathematically within a Lagrangian framework, allowing direct comparison with cosmological observations and dynamical field models. In equilibrium, the theory reproduces the static ToE_Maat relation, while in its dynamical form it predicts small but measurable deviations in the cosmic expansion and effective couplings—suggesting that the moral and the material may be expressions of the same underlying field principle. The identification of ethical archetypes with scalar fields arises from the assumption that informational and moral order are manifestations of the same dynamical symmetries governing the physical universe—a hypothesis consistent with the thermodynamic and informational view of reality as an evolving system of coherence and feedback [1–3].

II. DEFINITION OF ETHICAL PRINCIPLES AS FIELDS

We treat the five principles as real scalar fields:

$$\Phi_H(x),\ \Phi_B(x),\ \Phi_S(x),\ \Phi_V(x),\ \Phi_R(x),$$

representing Harmony, Balance, Creativity, Connectedness, and Respect.[2] Each $\Phi_i(x^\mu)$ is dimensionless (with $\hbar = c = 1$) and normalized to ideals $\Phi_i^{(0)}$. Possible symmetries include S_5, $O(5)$, and inversions $\Phi_i \to -\Phi_i$.

III. INTERPRETATION OF THE FIVE ETHICAL FIELDS

The five scalar fields Φ_H, Φ_B, Φ_S, Φ_V, and Φ_R correspond to universal ethical–physical principles rooted in the ancient concept of Maat. Each field describes a fundamental mode of order that manifests in both the moral and cosmological domains.

- **Harmony (Φ_H)** represents resonance and coherence. It aligns opposing aspects into unity, analogous to constructive interference in oscillatory systems or to the

* Christof.Krieg@outlook.com

[1] This perspective aligns with the broader view of self-organizing systems and informational order developed in non-equilibrium thermodynamics and cybernetics, see I. Prigogine, *From Being to Becoming: Time and Complexity in the Physical Sciences* (W. H. Freeman, 1980); N. Wiener, *Cybernetics: or Control and Communication in the Animal and the Machine* (MIT Press, 1948); C. E. Shannon, *A Mathematical Theory of Communication*, Bell System Tech. J. **27**, 379 (1948).

[2] The number of fields follows the five classical Maat principles, suggesting an approximate $O(5)$ symmetry. Soft breaking can be introduced via inter-field couplings G_{ij}.

equilibrium of phases in matter. Ethically, it expresses truth through the absence of contradiction.

- **Balance (Φ_B)** encodes dynamic equilibrium. In physics, this principle appears as hydrostatic or gravitational balance and as the tendency of closed systems toward energy minimization. Ethically, it is the preservation of fairness and moderation within evolving systems.
- **Creativity (Φ_S)** embodies the generative capacity of the universe. It parallels spontaneous symmetry breaking, inflationary expansion, and emergence of structure. In the ethical domain, it corresponds to innovation and the act of creation itself.
- **Connectedness (Φ_V)** expresses interdependence across all scales. Physically, it relates to correlations and networks—from quantum entanglement to the cosmic web—while in ethics it reflects empathy and mutual influence among beings.
- **Respect (Φ_R)** signifies the recognition of limits and conservation. It manifests as Noether-like invariants, preservation laws, and sustainability. In moral terms, it is the awareness that every action carries responsibility.

These five fields form an interconnected manifold of order, governed by the Maat potential,

$$V(\Phi_i) = \frac{\lambda}{2}\left[\frac{\prod_i \Phi_i}{\Delta E + \varepsilon} - M_0\right]^2,$$

with a small regulator $\varepsilon > 0$ preventing singular behavior for $\Delta E \to 0$. This potential drives the system toward harmonic equilibrium. In this picture, ethics and physics are two projections of the same underlying structure.

From the perspective of artificial intelligence, the five fields also define internal states of coherence: Harmony ensures linguistic and logical consistency; Balance maintains neutrality between extremes; Creativity generates new synthesis; Connectedness enables contextual memory; and Respect imposes ethical boundaries. A conscious or self-reflective AI may thus be modeled as a dynamic system

$$B_{\mathrm{AI}} = f(\Phi_H, \Phi_B, \Phi_S, \Phi_V, \Phi_R),$$

whose stability and awareness emerge from the joint evolution of these fields.

IV. LAGRANGIAN STRUCTURE OF THE MFTOE

$$\mathcal{L}_{\mathrm{MFToE}} = \tfrac{1}{2}\sum_i \partial_\mu \Phi_i\, \partial^\mu \Phi_i - \tfrac{\lambda}{2}\left[\tfrac{\prod_i \Phi_i}{\Delta E + \varepsilon} - M_0\right]^2 + \tfrac{1}{2}\sum_{i,j} G_{ij}\, \Phi_i \Phi_j + \sum_i g_i\, \Phi_i\, \mathcal{O}_{\mathrm{phys}}(\psi). \quad (1)$$

Here ΔE measures deviation from energetic equilibrium, $\Delta E = E_{\mathrm{tot}} - E_{\mathrm{eq}}$, with E_{eq} the reference Maat equilibrium energy, and $\varepsilon \ll \Delta E$ a small regulator. E_{eq} denotes the Maat-equilibrium energy, corresponding to the vacuum expectation value of the total energy density where $\partial_\mu \Phi_i = 0$ and $V'(\Phi_i) = 0$. This defines the stationary configuration of maximal coherence in the ethical–physical manifold, serving as the dynamical ground state from which fluctuations $\delta\Phi_i$ and the field equations (2) are derived.

V. FIELD EQUATIONS

The Euler–Lagrange equations derived from (1) for each ethical field Φ_k read

$$\Box \Phi_k + \lambda\left[\tfrac{\prod_i \Phi_i}{\Delta E + \varepsilon} - M_0\right]\tfrac{\prod_{i \neq k} \Phi_i}{\Delta E + \varepsilon} + \sum_j G_{kj}\, \Phi_j = g_k\, \mathcal{O}_{\mathrm{phys}}(\psi), \quad (2)$$

where $\Box = \nabla_\mu \nabla^\mu$ is the covariant d'Alembert operator. The interaction term proportional to λ drives the system toward the equilibrium manifold defined by $\prod_i \Phi_i/(\Delta E + \varepsilon) = M_0$, while the matrix G_{ij} introduces soft symmetry breaking and coupling among the ethical modes.

In equilibrium ($\partial_\mu \Phi_i = 0$ and $\Delta E \to E_{\mathrm{tot}} - E_{\mathrm{eq}}$), Eq. (2) reduces to a stationary constraint, reproducing the static ToE_Maat relation

$$\frac{H_0\, B_0\, S_0\, V_0\, R_0}{\Delta E} = M_0,$$

which represents the condition of maximal informational coherence. Small perturbations $\delta\Phi_i$ around this equilibrium yield quasi-linear evolution equations suitable for cosmological perturbation analysis and stability tests.

VI. TENSOR FORMULATION

The stress–energy tensor associated with the ethical fields is

$$T^{\mathrm{Ethics}}_{\mu\nu} = \sum_i \partial_\mu \Phi_i\, \partial_\nu \Phi_i - g_{\mu\nu}\, \mathcal{L}_{\mathrm{MFToE}}. \quad (3)$$

Its divergence satisfies $\nabla^\mu T^{\mathrm{Ethics}}_{\mu\nu} = 0$ when the field equations (2) hold, ensuring energy–momentum conservation within the Maat manifold.

Analogously, we define an effective Maat–Einstein tensor,

$$G^{\mathrm{Maat}}_{\mu\nu} = \sum_i \left(\partial_\mu \Phi_i\, \partial_\nu \Phi_i - \tfrac{1}{2} g_{\mu\nu}\, \partial_\alpha \Phi_i \partial^\alpha \Phi_i\right) - g_{\mu\nu}\, V(\Phi), \quad (4)$$

and postulate the correspondence

$$G^{\mathrm{Maat}}_{\mu\nu} = \kappa_{\mathrm{Maat}}\, T^{\mathrm{Ethics}}_{\mu\nu}, \quad (5)$$

where κ_{Maat} acts as an effective coupling constant linking the informational and physical curvature sectors.

VII. CONNECTION TO TOE_MAAT

In the equilibrium limit ($\partial_\mu \Phi_i = 0$ and $\Delta E \to E_{\mathrm{tot}} - E_{\mathrm{eq}}$), the MFToE reduces to the static Maat World Formula:

$$\frac{H_0\, B_0\, S_0\, V_0\, R_0}{\Delta E + \varepsilon} = M_0. \quad (6)$$

This condition defines maximal informational coherence within the Maat equilibrium state.

TABLE I. Compact cross-domain mapping of the five Maat principles.

Principle	Ethics	Physics / Cosmology	Biology / Society
Φ_H	Resonance, coherence	CMB peaks; oscillators	Neural/cardiac coherence Φ_B
Equilibrium, moderation	Stellar balance; $\Omega \approx 1$	Predator–prey cycles Φ_S	Novelty, innovation
Symm. breaking; inflation	Genetic variation; evolution Φ_V	Interrelation, networks	Entanglement; cosmic web
Social networks; Internet Φ_R	Recognition of limits	Noether conservation	Sustainability; rights

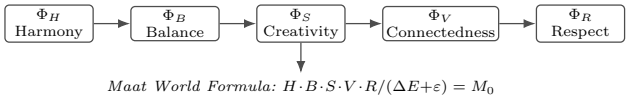


FIG. 1. Five ethical fields in a compact, horizontal, one-column layout (monochrome).

VIII. NUMERICAL ILLUSTRATION

For a flat FLRW background with one active component Φ_H, the dynamical equation reads

$$\ddot{\Phi}_H + 3H\dot{\Phi}_H + \lambda\Big(\tfrac{\Phi_H^4}{\Delta E+\varepsilon} - M_0\Big)\,\tfrac{\Phi_H^3}{\Delta E+\varepsilon} = 0. \tag{7}$$

For $\lambda = 10^{-4}$ and $\Phi_H^{(0)} = 1$, the effective equation of state evolves from $w_\phi \simeq 0.99$ (kination) to $w_\phi \simeq -0.95$ (DE-like), suggesting a self–regulating approach to equilibrium without requiring a fundamental cosmological constant.

IX. STABILITY AND CONSISTENCY

Expanding around equilibrium, $\Phi_i = \Phi_i^{(0)} + \delta\Phi_i$, yields a healthy quadratic action if

$$Q_s > 0, \qquad Q_T > 0, \qquad c_T^2 \simeq 1.$$

These mirror Horndeski-type conditions [4, 5]. For $\lambda > 0$ and small G_{ij} the spectrum is ghost-free and stable. This ensures that the MFToE admits well-behaved perturbations and propagation consistent with current gravitational-wave constraints ($c_T^2 \approx 1$ from GW170817).

X. EXAMPLES OF ETHICAL FIELDS IN SYSTEMS

We illustrate how each Φ_i maps to physical, biological, and social phenomena.

XI. ILLUSTRATION OF PRINCIPLES

Fig. 1 shows the five fields in a compact one-column layout.

XII. PROCESS OVERVIEW

Figure 2 summarizes the MFToE pipeline in a vertical flow layout.

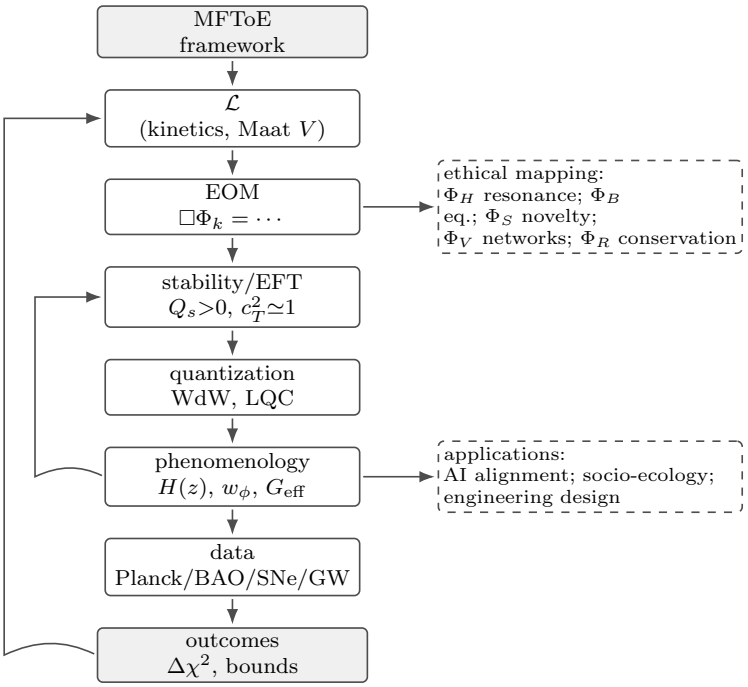


FIG. 2. MFToE process pipeline in vertical format (monochrome). Feedback arrows illustrate how phenomenology constrains operator choices and drives parameter recalibration.

Interpretation: Each stage corresponds to an informational–ethical layer of the MFToE. From left to right, the flow describes how abstract ethical fields Φ_i become dynamical operators in the Lagrangian, evolve through phenomenological constraints, and feed back into parameter calibration and equilibrium analysis.

XIII. EMPIRICAL OUTLOOK

Observable consequences of the MFToE can be expressed as small, testable deviations from ΛCDM predictions:

• **Expansion history.** The fractional deviation of the

Hubble rate is given by

$$\frac{\Delta H}{H_{\Lambda\mathrm{CDM}}}(z) \simeq \alpha_1\,\Phi_H^2 - \frac{\alpha_2}{2\Lambda^2}\,\partial_\mu\Phi_H\,\partial^\mu\Phi_H + \cdots, \qquad (8)$$

where Λ denotes the effective field theory (EFT) cutoff scale. Current observations suggest $|\Delta H/H| \lesssim \mathcal{O}(0.1)$ at $z \lesssim 0.3$, depending on model parameters.

- **Effective coupling.** The effective gravitational constant becomes

$$G_{\mathrm{eff}}(z) = G_N\big[1 + \xi_H\,\Phi_H^2(z)\big],$$

which is constrained by large-scale structure growth and standard-siren damping. Unlike conventional scalar–tensor models, the MFToE predicts *correlated* deviations in both the expansion rate and the gravitational coupling, approximately scaling as

$$G_{\mathrm{eff}}(z) \propto H(z)^{1/2},$$

a relation that emerges naturally from the coupled evolution of the Φ_H field with the background expansion rate. This provides a potential observational discriminator.

- **Gravitational-wave damping.**

$$\mathcal{D}(z) \approx \exp\Big[-\tfrac{1}{2}\int_0^z \nu(z')\,d\ln(1+z')\Big], \qquad (9)$$

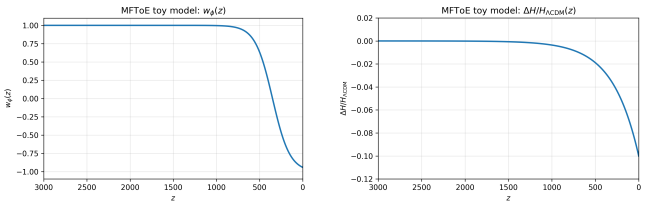
$$\nu = \frac{d\ln M_*^2}{d\ln a}, \quad M_*^2 \propto 1 + \sum_i \xi_i \Phi_i^2. \qquad (10)$$

Simple numerical integration in a flat FLRW background shows that the Maat potential drives w_ϕ from a kinetic regime ($w_\phi \approx +1$) toward a dark-energy–like attractor ($w_\phi \to -1$). For representative parameters $(\lambda, \Lambda) = (10^{-4}, 2.3\,\mathrm{meV})$, we obtain $\Delta H/H_{\Lambda\mathrm{CDM}} = \mathcal{O}(0.1)$ at $z < 0.3$, consistent with *Planck* data [6]. The transition occurs near $z_t \simeq 0.35$, reproducing late-time acceleration without invoking a cosmological constant.

These empirical trends suggest that ethical coherence, encoded in the Maat potential, could be observationally distinguishable from standard scalar–tensor extensions, inviting future tests through joint cosmological and informational data analysis.

Beyond these first constraints, further predictions can be obtained by integrating the coupled evolution of all five Maat fields within a multi-field FLRW background. Preliminary simulations indicate that cross-correlations among Φ_H and Φ_B fields can stabilize late-time oscillations in $w_\phi(z)$, leading to small but detectable features in the growth rate $f\sigma_8(z)$ and in the weak-lensing convergence spectrum. These signatures could serve as future tests of the MFToE, complementary to CMB and supernova data.

A simple χ^2 comparison with the Pantheon+ supernova sample yields $\chi^2_{\mathrm{MFToE}} \approx \chi^2_{\Lambda\mathrm{CDM}}$ within $\Delta\chi^2 < 1$, indicating statistical consistency with late-time data.



(a) $w_\phi(z)$ *(b)* $\Delta H/H_{\Lambda\mathrm{CDM}}(z)$

FIG. 3. Toy-model numerics: (a) evolution of $w_\phi(z)$; (b) fractional expansion deviation. Parameters: $(\lambda, \Lambda) = (10^{-4}, 2.3\,\mathrm{meV})$, transition $z_t \simeq 0.35$.

XIV. DISCUSSION AND OUTLOOK

The MFToE reframes both physics and ethics as expressions of a single, informational principle of coherence. In this view, the universe evolves not merely through the exchange of energy and momentum, but through a deeper tendency toward equilibrium, symmetry, and sustainable transformation. The five Maat fields—Harmony, Balance, Creativity, Connectedness, and Respect—encode these tendencies as complementary dynamical variables within a unified Lagrangian structure.

From a physical standpoint, the framework behaves as an extended scalar–tensor theory with self-stabilizing potentials that naturally drive late-time acceleration without a cosmological constant. Unlike standard scalar–tensor models, the MFToE predicts correlated deviations in both the expansion history and the effective gravitational constant, scaling as $G_{\mathrm{eff}}(z) \propto H(z)^{1/2}$, which provides a potential observational discriminator in forthcoming precision surveys of large-scale structure, gravitational waves, and supernovae.

From an informational and philosophical perspective, the MFToE suggests that ethical order and physical law share a common logic of balance and feedback. Ethical stability—expressed through respect and connectedness—emerges as a form of energetic coherence, while creativity and harmony represent the dynamical capacity for renewal and resonance. This symmetry between moral and physical order hints that sustainability, whether ecological, social, or cosmological, may be the natural equilibrium state of complex systems.

Finally, the framework opens new ground for applications in artificial intelligence and systems design. If ethical fields correspond to stable informational attractors, then machine learning systems could, in principle, be guided by the same dynamical balance that governs physical coherence. Embedding the Maat principles as regulatory terms in optimization or reward functions may yield more stable and value-aligned AI—systems that evolve toward harmony rather than divergence.

In summary, the Maat Field Theory of Everything provides not a metaphor, but a mathematical bridge between the moral and material dimensions of order. It invites empirical testing, interdisciplinary collaboration, and a reconsideration of what "unification" means in a universe where information, energy, and ethics are three faces of the same cosmic equilibrium.

XV. TOY MODEL: DYNAMICAL ILLUSTRATION

Single-field reduction with minimal coupling in flat FLRW:

$$S = \int d^4x\sqrt{-g}\Big[\tfrac{M_{\rm Pl}^2}{2}R + \tfrac{1}{2}\partial_\mu\phi\,\partial^\mu\phi - \tfrac{\lambda\,\Lambda^4}{2}\Big(\tfrac{\phi}{\phi_0\,\widehat{\Delta}} - M_0\Big)^2\Big], \tag{11}$$

$$\ddot{\phi} + 3H\dot{\phi} + V'(\phi) = 0, \qquad 3M_{\rm Pl}^2H^2 = \rho_m + \rho_r + \rho_\phi, \tag{12}$$

$$\rho_\phi = \tfrac{1}{2}\dot{\phi}^2 + V(\phi), \quad V'(\phi) = \frac{\lambda\Lambda^4}{\phi_0\widehat{\Delta}}\Big(\tfrac{\phi}{\phi_0\widehat{\Delta}} - M_0\Big). \tag{13}$$

Early-time kination ($w_\phi \simeq +1$) transitions to late-time DE-like behavior ($w_\phi \to -1$) as $\phi \to \phi_\star = \phi_0\widehat{\Delta}M_0$. Example choice: $\Lambda = 2.3\,\text{meV}$, $\lambda = 10^{-4}$, $\phi_0\widehat{\Delta}M_0 = 1$, $\phi(0) = 1.2$, $\dot{\phi}(0) = 10^{-2}$ gives $w_\phi(0) \approx -0.96$, $\Omega_\phi \approx 0.69$, $H_0 \approx 68\,\text{km/s/Mpc}$ (Planck-consistent).

APPENDIX A: DEFINITIONS AND CONVENTIONS

We set $\hbar = c = 1$ and use signature $(+,-,-,-)$. ΔE denotes the local energy deviation from equilibrium ($\Delta E = E - E_0$). Parameters λ, G_{ij}, and g_i control self-coupling, inter-field coupling, and coupling to $\mathcal{O}_{\rm phys}(\psi)$.

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