Title: Rethinking the Foundations: A Three-Pillar Model of the Universe

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Abstract: This paper proposes a speculative but conceptually grounded model of the universe in which gravity, dark matter, and dark energy constitute the foundational pillars of reality. Traditional physics categorizes the four fundamental forces as the base structure of physical law. However, this theory argues that electromagnetism, the strong nuclear force, and the weak nuclear force are emergent "sub-forces" arising from deeper interactions within or due to the influence of a primary dark matter field. Gravity appears as spacetime curvature induced by this field, and dark energy as its intrinsic expansive dynamics.

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1. Introduction Modern physics identifies four fundamental forces: gravity, electromagnetism, the strong nuclear force, and the weak nuclear force. Unification remains elusive, particularly between gravity and quantum mechanics. We propose a causal hierarchy: **dark matter** is the fundamental field; **gravity** and **dark energy** are secondary phenomena emergent from it; the remaining forces are localized excitations within that framework.

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2. The Three Pillars of the Universe

2.1 Gravity Einstein's general relativity describes gravity as spacetime curvature. Here, we posit that spacetime geometry itself is shaped by the dark matter field's distribution and dynamics, making gravity a manifestation of that field.

2.2 Dark Matter Observed through rotation curves, lensing, and structure formation, dark matter is treated as a continuous cosmological field—an ontological substrate that stabilizes cosmic architecture.

2.3 Dark Energy Rather than a separate cosmological constant, dark energy is viewed as an intrinsic elastic expansion of the dark matter field, driving accelerated cosmic expansion.

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3. Sub-Forces as Emergent Phenomena

3.1 Electromagnetism Emerges from wave-like perturbations or resonances in the dark matter field in regions of charged matter.

3.2 Strong & Weak Nuclear Forces Localized, high-density excitations or symmetry breakings of the dark matter field, operative at subatomic scales.

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4. Philosophical & Theoretical Implications Aligns with emergent gravity, holographic principles, and field unification—suggesting that particles and forces are transient patterns within a deeper medium.

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5. Future Directions & Predictions - **Emergent Gravity (Verlinde's formula):**
[a = a_N + sqrt(a_N * a_0)]
where a_N = GM / r^2 and a_0 = c * H_0 ≈ 1.2×10^-10 m/s^2.
- **K-essence Unified Dark Fluid:**
Lagrangian L = P(X,φ), X = -1/2 g^μν ∂_μ φ ∂_ν φ.
Energy density ρ = 2X · ∂P/∂X - P, pressure p = P(X,φ) yields ρ ∝ a^-3 and w ≈ -1.
- **Phenomenological Dark Fluid EOS:**
p = γ (ρ - ρ*) with 0 ≤ γ ≤ 1, interpolating between dust (dark matter) and vacuum (dark energy).
- Develop numerical simulations of galaxy rotation curves, gravitational lensing, and cosmic microwave background anisotropies within this framework.

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6. Conclusion By elevating dark matter to a primary cosmological field, we provide a unified causal account of gravity and dark energy, with standard forces as emergent phenomena. This framework offers a promising route toward a cohesive Theory of Everything.

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7. Simple Explanation & Mathematical Details

7.1 Simple Explanation - **Dark Matter Field**: Envision the cosmos filled with an invisible fluid—dark matter.
- **Gravity**: Objects move along curved paths defined by this fluid's geometry.
- **Dark Energy**: The fluid naturally expands, stretching space.
- **Other Forces**: Local ripples in the fluid manifest as electromagnetic, strong, and weak forces.

7.2 Mathematical Framework 1. **Residual Acceleration (Verlinde):** a(r) = GM/r^2 + sqrt((GM/r^2) * a_0), a_0 = c H_0 ≈ 1.2×10^-10 m/s^2. 2. **K-essence Lagrangian:** L = P(X,φ), X = -½ g^μν ∂_μφ ∂_νφ;
ρ = 2X P_X - P, p = P(X,φ). 3. **Dark Fluid Equation of State:** p = γ (ρ - ρ*), 0 ≤ γ ≤ 1.

Key Parameters: - G: gravitational constant
- M, r: mass and radial distance
- c: speed of light, H_0: Hubble constant
- φ, X, P: scalar field variables
- γ, ρ*: EOS parameters

Keywords: gravity, dark matter, dark energy, emergent phenomena, unification, k-essence, Verlinde gravity