

The Grude Nmax Hypothesis

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Abstract

The Grude Nmax Hypothesis proposes a scalar boson field, Nmax, as a counterbalance to the Higgs field in a yin-yang duality. While the Higgs imparts mass, Nmax imposes finite limits on spacetime curvature, causality, and light propagation, addressing unresolved issues in general relativity. Inspired by wave-based thinking and a curiosity for invisible forces, Nmax prevents singularities in black holes by forming stable field-regulated nodes, stabilizes Einstein-Rosen bridges without exotic matter, and triggers dramatic mass expulsion from black holes through its balance with gravity. Observable signatures include curvature saturation at ~ 0.465 AU from massive bodies, measurable via light deflection and gravitational ripples, and black hole anomalies detectable with LISA, Taiji, or the Event Horizon Telescope. This hypothesis is a pointer to inspire fearless exploration of spacetime, urging physicists to test its predictions and rethink foundational assumptions.

1. Introduction

General relativity's prediction of singularities and reliance on exotic matter for wormholes reveal gaps in our understanding of spacetime. The Grude Nmax Hypothesis, born from a ham radio operator's wave-based perspective and expertise in electronics, introduces a scalar field, Nmax ($\sim 1.78e-17$ eV, Compton wavelength ~ 0.465 AU), which limits curvature and causality as a complement to the Higgs field. This hypothesis serves as a pointer to explore new possibilities-preventing singularities, stabilizing wormholes, and regulating the speed of light-with

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testable predictions for black hole dynamics and AU-scale measurements.

2. Theoretical Framework

2.1 Higgs-Nmax Duality: The Higgs (Yang) grants mass; Nmax (Yin) limits curvature and causality, preventing gravitational collapse in a balanced interplay reminiscent of wave dynamics.

2.2 Curvature Saturation: Nmax imposes a ceiling on spacetime curvature, observable where light scattering terminates (~0.465 AU for the Sun), measurable with AU-scale instruments.

2.3 Emergent Light Speed: The speed of light may emerge from Nmax's modulation of the vacuum's refractive index, akin to electromagnetic wave propagation in media.

2.4 Toy Lagrangian: $\mathcal{L} = \mathcal{L}_{\text{Higgs}} + \frac{1}{2} \partial^\mu N \partial_\mu N - V(N) + \alpha N R + \beta N F_{\mu\nu} F^{\mu\nu} + \gamma N T_{\mu\nu} T^{\mu\nu}$, where N is the Nmax field, $V(N)$ has a negative VEV, R is curvature, $F_{\mu\nu}$ is the electromagnetic field tensor, and $T_{\mu\nu}$ is the energy-momentum tensor, modeling mass expulsion dynamics. This framework is suggestive, inviting refinement.

3. Black Holes and Nmax

Black holes, with extreme curvature, are ideal for probing Nmax. The field prevents singularities by forming stable nodes and triggers mass expulsion through its yin-yang balance with gravity, producing bursts distinct from Hawking radiation. These may appear as anomalous gravitational wave ringdowns (LIGO, LISA), lensing deviations (Event Horizon Telescope), or energy bursts (Fermi, CTA).

4. Einstein-Rosen Bridges

Nmax stabilizes wormhole throats by countering gravitational collapse, eliminating the need for exotic matter. This revives Einstein and Rosen's 1935 concept, suggesting stable, field-supported wormholes with AU-scale signatures in light deflection or gravitational ripples.

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5. Testable Predictions

- Curvature saturation at ~ 0.465 AU from massive objects.
- Gravitational wave ringdown deviations or mass ejection signatures (LISA, Taiji).
- Lensing anomalies or Hawking radiation shifts near black holes (EHT, analogue experiments).

6. Discussion

The Nmax Hypothesis is a call to explore uncharted territory, inspired by a wave-based perspective on invisible forces. By proposing a field that caps gravity's reach, it challenges the completeness of general relativity and invites reconsideration of overlooked models. As Grude (LA9FMA) notes, 'Logic is free'-physicists should approach new ideas with curiosity, not fear. Upcoming experiments (LISA, EHT) offer opportunities to test Nmax's effects, potentially reshaping our understanding of spacetime.

7. References

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8. Acknowledgment

This hypothesis is the original work of Ole Frithjof Grude (LA9FMA), a licensed ham radio operator (callsign LA9FMA) with a background in electricity and electronics, driven by a curiosity for invisible forces and a wave-based perspective on physics. Developed through independent study, it aims to

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inspire fearless thinking in theoretical physics.

"Some models are forgotten not because they were wrong, but because the field they needed had not been imagined yet."

- Ole Frithjof Grude (LA9FMA)