

Seven Established Scientific Foundations (SF1 – SF7)

SF1. The Universe is Expanding.



SF2. Bound Systems Do Not Expand with the Universe.



SF3. Quantum Field Theory (QFT) is Experimentally Established.



SF4. Quantum Fields Can Be All-Pervading.



SF5. Singlet Scalar Fields Are Legitimate in QFT.



SF6. Singlet Scalar Fields Can Couple to the Standard Model.



SF7. Singlet Scalar Fields Can Carry Energy, Tension, and Stress.



**If any person can show just cause to reject any of these,
please speak now.**

11 Physics Mysteries (PM1 – PM11)

PM1. What is the **physical causal origin** of gravitation?

PM2. What is the **physical causal origin** of inertia?

PM3. What is the **physical causal origin** of dark matter

PM4: What is the **physical causal origin** of dark energy and the Hubble tension?

PM5. What is the **physical causal origin** of **anomalous, internally-driven glitches of compact objects** (neutron stars, pulsars etc)?

PM6. Can gravitation **emerge from a physically real mechanism** within quantum field theory?

PM7. Can a **deeper physical theory reproduce the established successes** of Galileo, Kepler, Newton and Einstein?

PM8. **Where does General Relativity cease to supply accurate prediction** of what we observe?

PM9. Can the **double-slit experiment** be given an **underlying physical mechanism** rather than a **probabilistic** description?

PM10. Can the **experimental foundations** of quantum mechanics be reconstructed while **retaining physical realism**?

PM11. What is the **physical causal origin** of atomic structure?

“so great an Absurdity that I believe no Man who has in philosophical Matters a competent Faculty of thinking can ever fall into it.” Newton 1692

referring to the idea of gravity's action-at-a-distance without a mediating aether.

“.. I have not been able to discover the cause...

I frame no hypotheses”

Newton 1713

“...in truth is conveyed by a medium permeating space...by elastic deformation of this medium”

Einstein 1920

“space without ether is unthinkable”.

Einstein 1920

“Evidently a complete theory must be based on a field of a more complex nature”.

Einstein 1950

PM1 Proposal:

The different states described in **SF1** and **SF2** are physically connected by a **single field mechanism** consistent with **SF3, SF4, SF5**, and **SF7**.

Two different
states

SF1. The Universe is Expanding.

SF2. Bound Systems Do Not Expand with the Universe.

...physically connected by...

Single field
Mechanism

SF3. Quantum Field Theory (QFT) is Experimentally Established.

SF4. Quantum Fields Can Be All-Pervading.

SF5. Singlet Scalar Fields Are Legitimate in QFT.

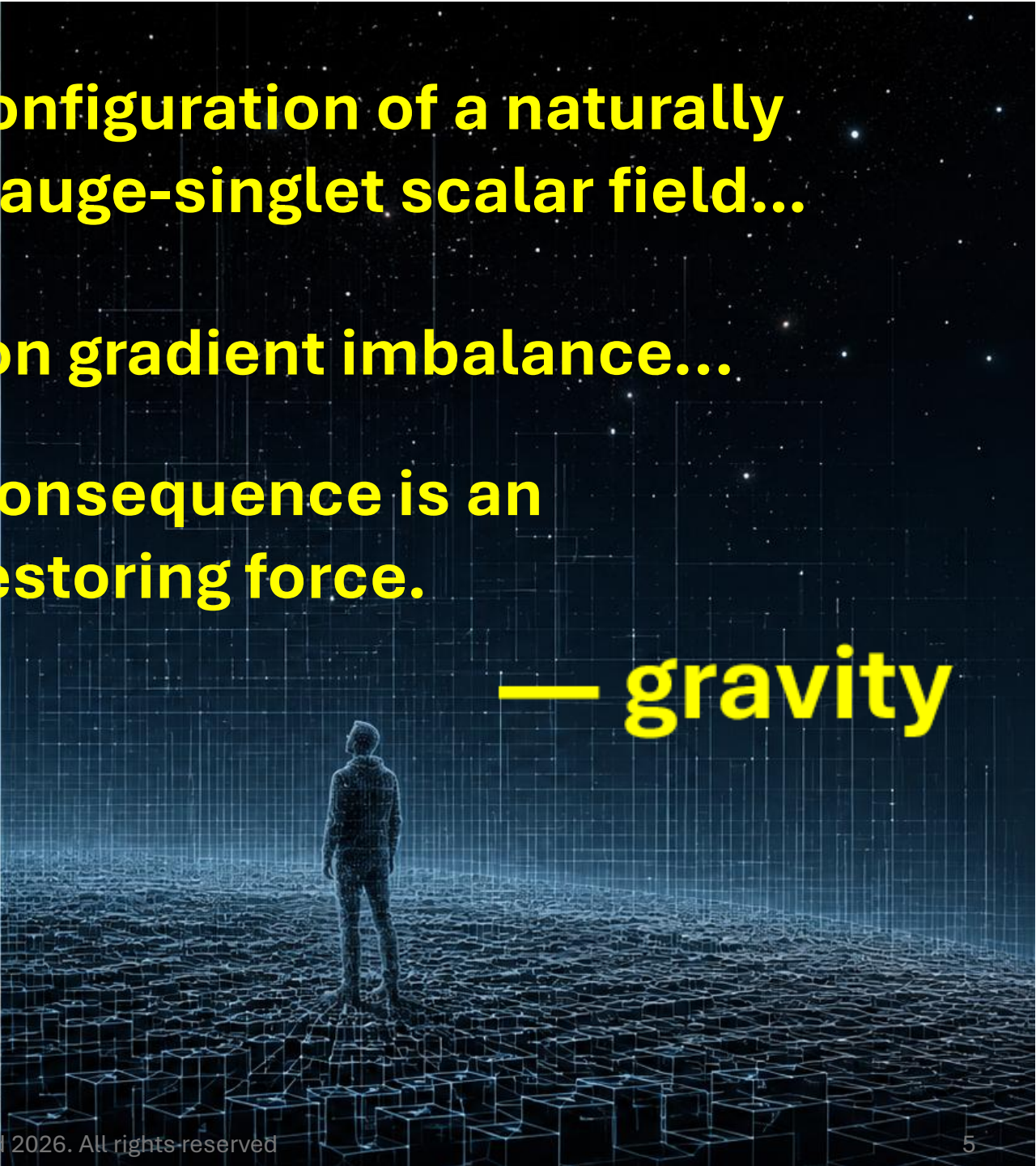
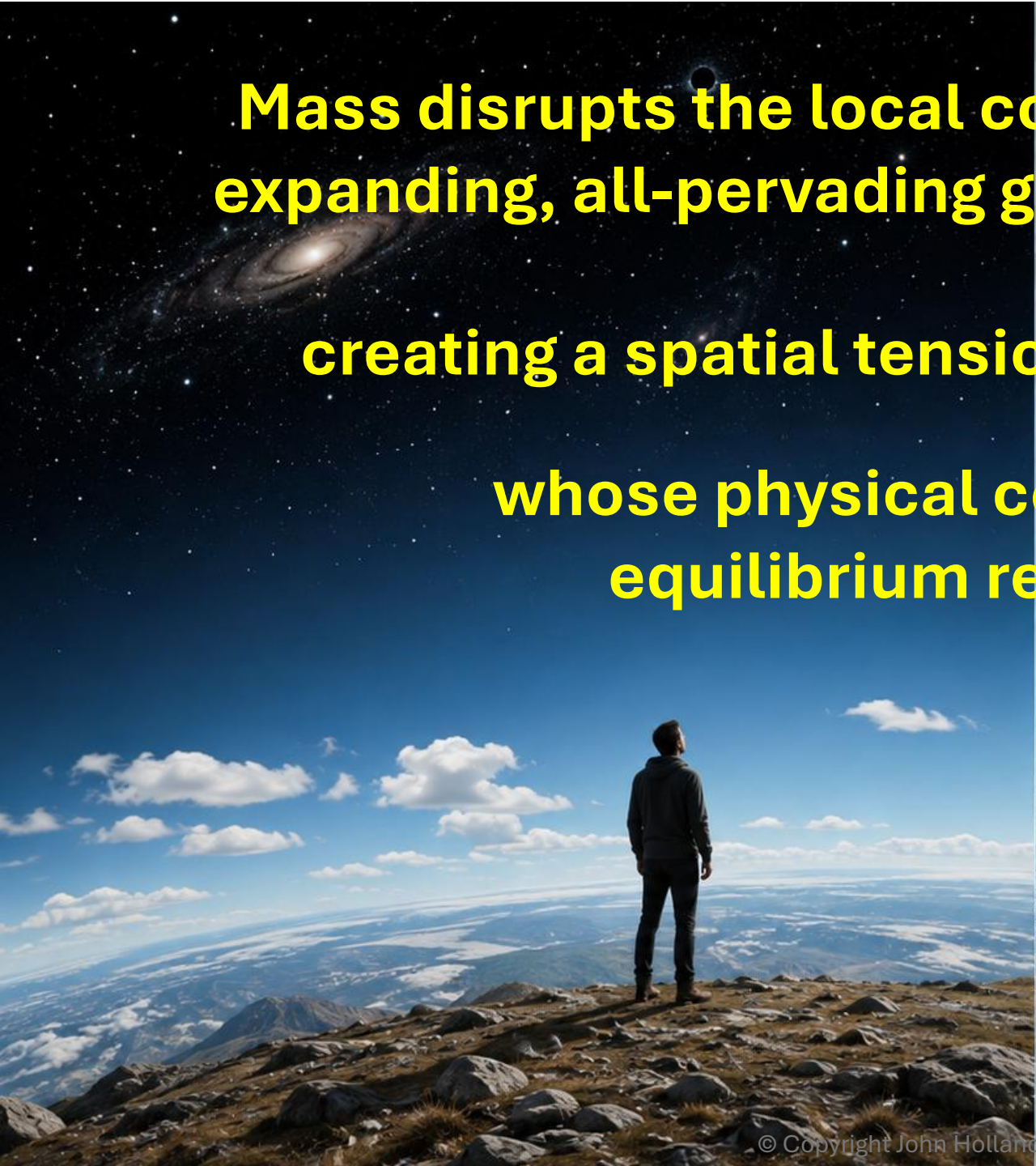
SF7. Singlet Scalar Fields Can Carry Energy and Stress.

**Mass disrupts the local configuration of a naturally
expanding, all-pervading gauge-singlet scalar field...**

creating a spatial tension gradient imbalance...

**whose physical consequence is an
equilibrium restoring force.**

— gravity



PM1 GRAVITY:



Expanse Tension Theory: A Unified QFT Framework for Gravitation, Inertia, and Cosmic Evolution

Holland, John Edward <https://doi.org/10.5281/zenodo.16884165> Published 12 August, 2025. 155 pages,

1. Postulates the **Holland Field Φ** and its **field equation**
2. A **QFT-compatible** scalar-field mechanism – a field-theoretic derivation
3. Derived **an equilibrium restoring acceleration**
4. Then attempted to calculate **Earth gravity**...
5. The first outcome: **-9.81 m s^{-2} at Earth's surface, consistent with terrestrial gravity.**
6. Did not assume **Newton's** gravitational force law or **Einstein's** geometric field equations.
7. Independent repeat: **reproduced solar gravity and the Sun's gravitation field across the planetary system.**

PM2 INERTIA:

Proposal: Matter exists within, **and locally configures**, the quantum scalar field.

The Holland Field Φ

SF3 - 7 permit a **physically real, all-pervading scalar field** whose **configuration** can possess energy and stress.

1. Matter **establishes an equilibrium configuration within the Holland Field.**
2. Acceleration – **a change in velocity – forces it to reconfigure.**
3. The energetic resistance **to that reconfiguration is experienced as inertia.**
4. Uniform motion **preserves the equilibrium configuration and represents kinetic energy**



Expanse Tension Theory – Framework foundations, illustrative effect, and new insight

Holland, John Edward <https://doi.org/10.5281/zenodo.17020387> Published September 1, 2025

Dark Matter

Below $10^{-21.6} \text{ kg m}^{-3}$ matter becomes coupled to the naturally expanding Holland Field generating stronger restoring-tension gradient. The outer matter responds with extra inward acceleration – keeping the halo together without additional unseen mass.

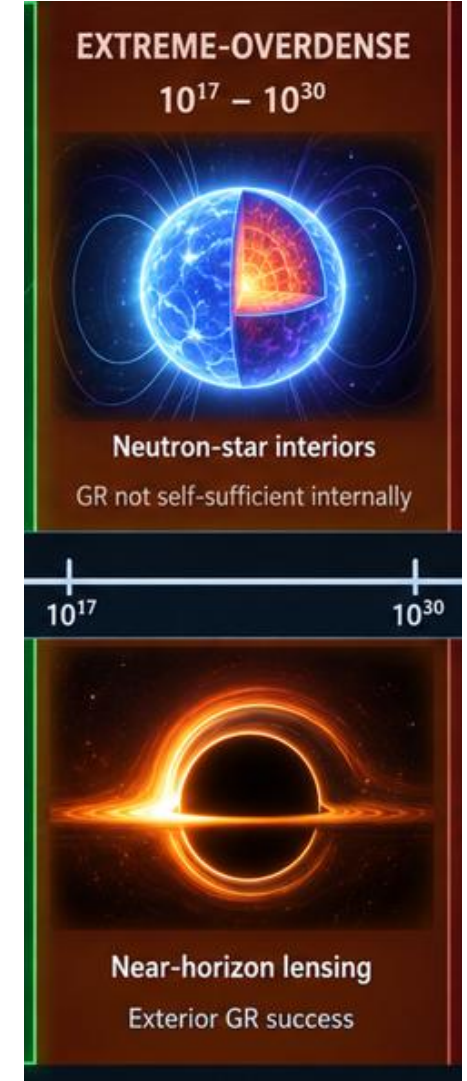
Dark Energy

Below $10^{-27} \text{ kg m}^{-3}$ matter can no longer constrain the naturally expanding Holland Field: the constraint releases, and dynamical late-time acceleration emerges. The universe untethered, unleashed from matter's restraint realises its maximum equilibrium restoring potential rate

Matter-Bound Systems

PM5. Why do compact objects exhibit anomalous, internally driven glitches

- Ultra-dense neutron stars exhibit sudden rotational glitches — abrupt transfers of angular momentum originating somewhere within the star.
- The behaviour emerges only in extreme-density compact objects; lower-density compact remnants such as the “Zombie Star” provide an important contrasting case – no anomaly.
- GETT proposes a density transition — at $10^{17} \text{ kg m}^{-3}$ where Holland-field coupling begins to re-activate.
- The compact object inner core reaches the ultra-high threshold density first.
- The naturally expanding singlet scalar field couples to matter with greater strength.
- Matter progressively enters a different matter-field equilibrium state; the resulting change in effective inertia / moment of inertia forces angular momentum to redistribute through the star, producing the observed glitch.



$$\rho \sim 10^{17} \text{ kg m}^{-3}$$



The Gauge-Invariant Singlet Scalar Field and Its Higgs-Portal Coupling

Holland, John 

<https://doi.org/10.5281/zenodo.17794364> Published December 2, 2025. 18 pages

- Establishes the **Quantum Field Theory (QFT) substrate**.
- The **Holland Field Φ is a legitimate** Lorentz-scalar, Standard-Model gauge singlet; a renormalisable Higgs portal is available; and, at fixed environmental density, the density-modulated portal preserves the familiar singlet-Higgs operator structure, stability, unitarity and renormalisability.
- ***“We conclude that a gauge-invariant singlet scalar with density-modulated Higgs-portal strength constitutes a theoretically coherent and perturbatively consistent extension of the Standard Model.”***

Submitted into a world-renowned expert peer review

OXFORD
ACADEMIC

Monthly Notices
of the Royal Astronomical Society

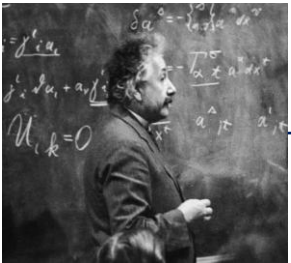
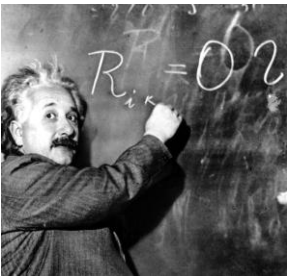
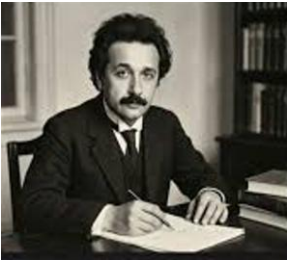
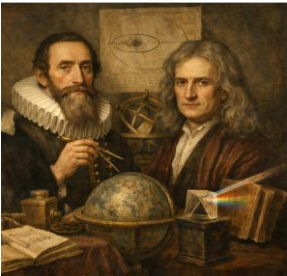
“the analysis is **technically consistent** at a formal level...”

“For any fixed value of p [density], the model is exactly **equivalent to the standard singlet-Higgs portal** scenario with a redefined effective coupling.”

“Correspondence” means that a new theory must reproduce the successful predictions of established physics in the regimes where those theories are already known to work.

GETT CORRESPONDENCE SERIES — DOMAIN-LIMIT FRAMEWORK

From Fundamental Scalar Field Φ to Emergent Physical Theories



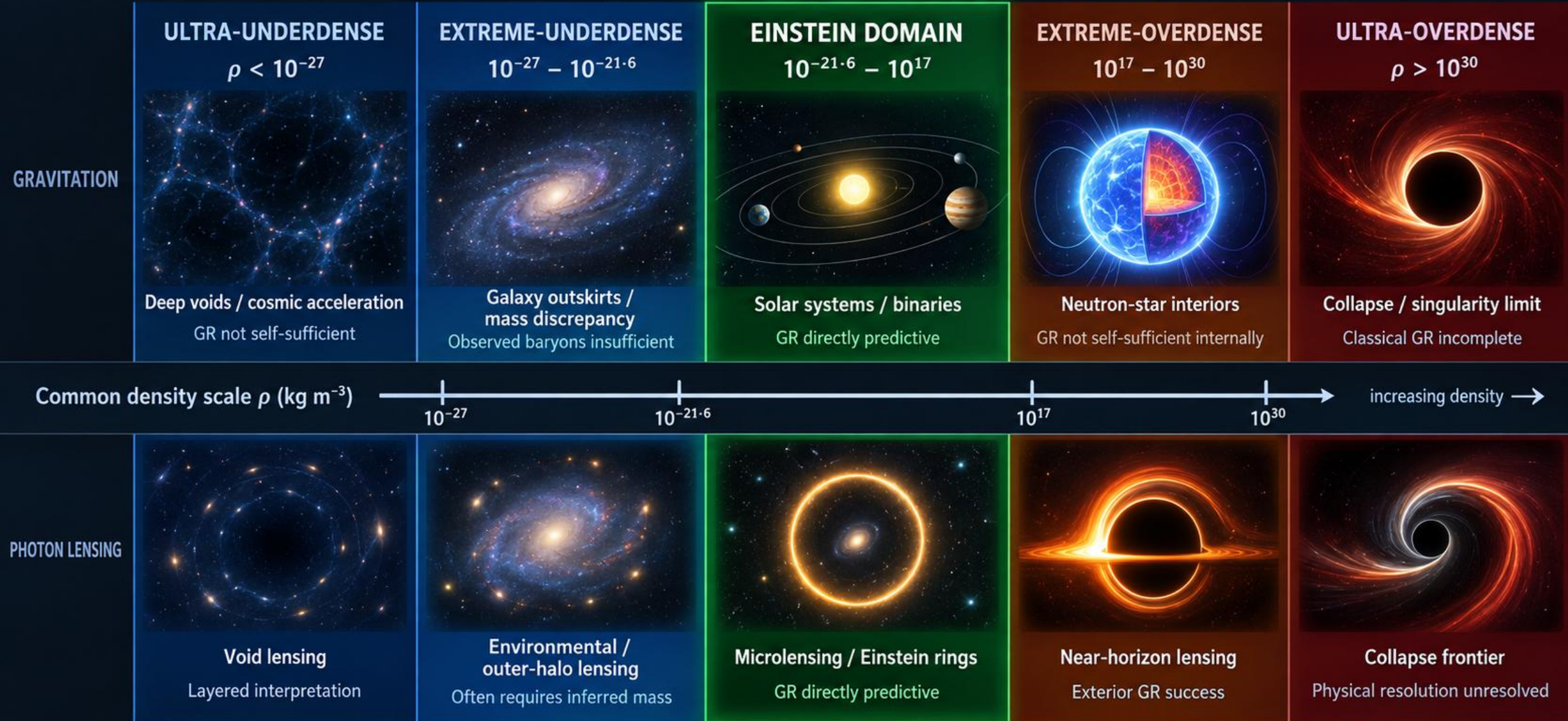
PAPER		PHYSICAL DOMAIN	RECOVERED FRAMEWORK
PAPER 1 Kinematics & Inertial Baseline		Uniform inertial environments	 Classical kinematics (Galilean limit)
PAPER 2 Newtonian Gravity Correspondence		Weak-field, static gravitational systems	 Newtonian gravity (Poisson limit)
PAPER 3 Special Relativity Correspondence		Homogeneous, isotropic propagation environments	 Special Relativity (Lorentz invariance)
PAPER 4.1 Metric Emergence		Smooth-field regimes	 Emergent metric structure $g_{\mu\nu}^{eff}$
PAPER 4.2 Einstein-Domain Dynamics		Weak-field, smooth spacetime environments	$G_{\mu\nu} = 8\pi G T_{\mu\nu}$ Einstein field equations (GR dynamics)
PAPER 4.3 Empirical GR Recovery		Experimentally tested weak-field regimes	 Full recovery of GR observables (9 canonical tests)



Correspondence first. New physics only where correspondence breaks.

GETT: EINSTEIN DOMAIN AND BEYOND

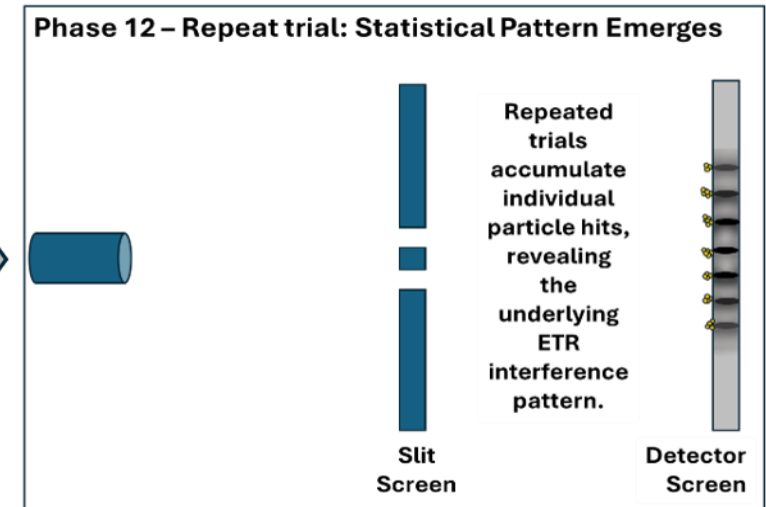
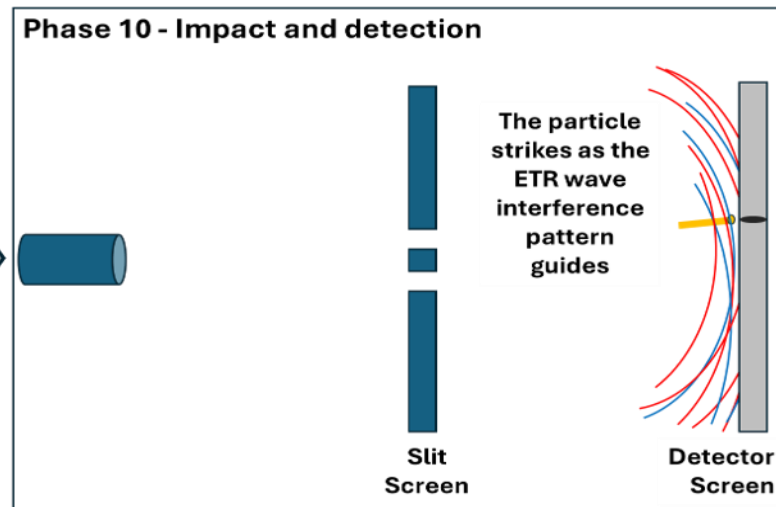
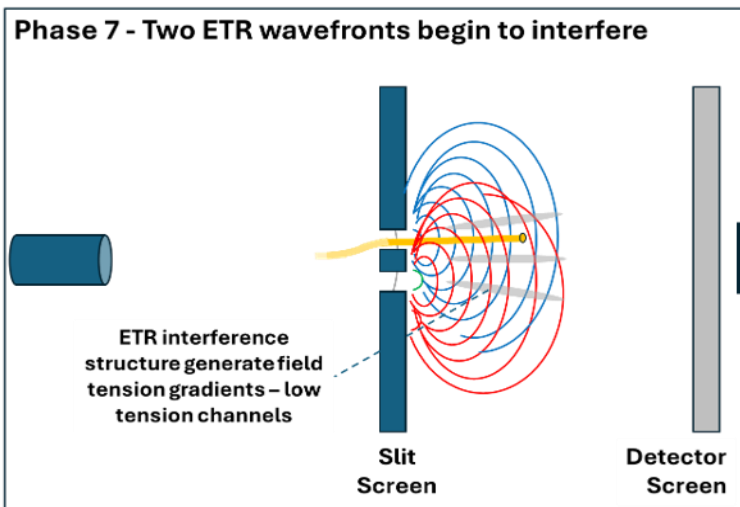
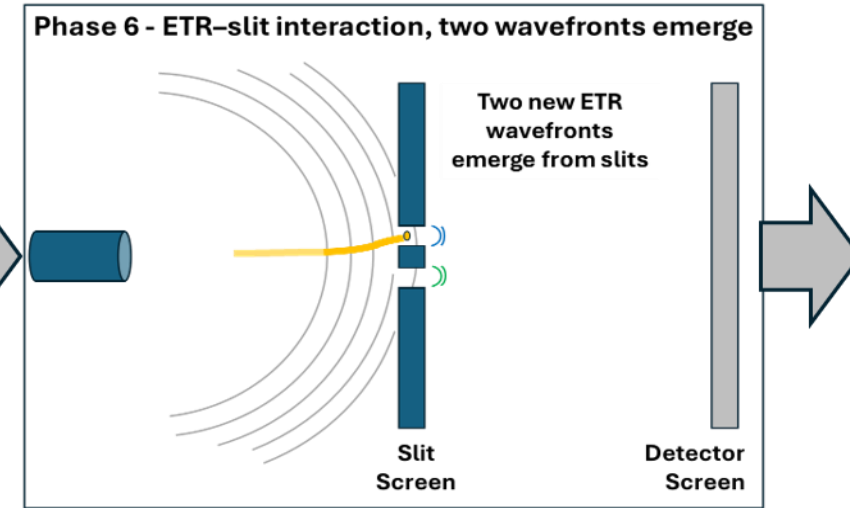
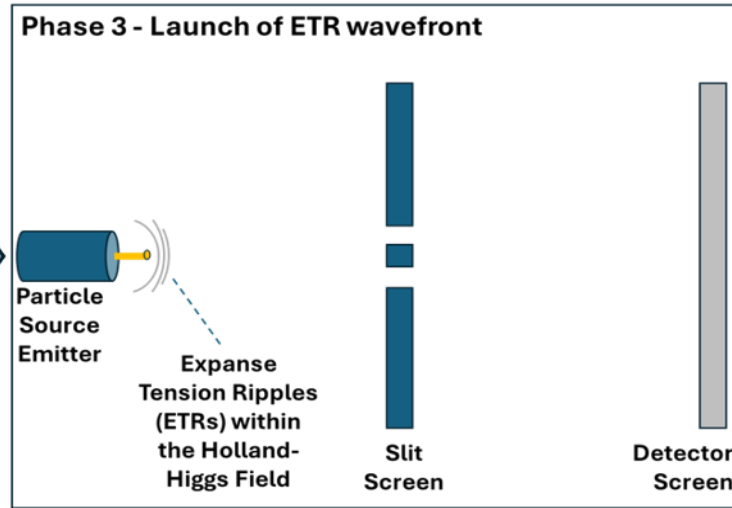
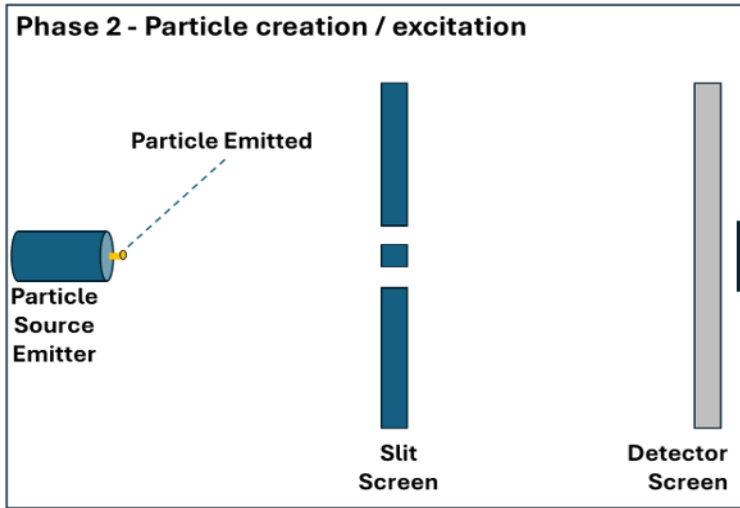
Common density structure across gravitation and photon lensing



GETT view: GR is the successful plateau regime; beyond it, a deeper density-regulated physical mechanism is sought.

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PM9: DOUBLE-SLIT WITH HOLLAND FIELD:



ONE SCALAR RESONANCE-LOCK MECHANISM EXPLAINS FOUR DISTINCT PHENOMENA

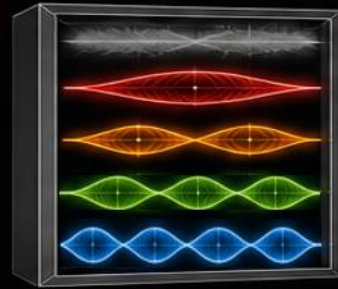
The Holland Field, Φ — the all-pervading scalar field substrate

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Only integer harmonics ($n = 1, 2, 3, 4, \dots$) satisfy phase closure and persist as stable, observable states.

1 BLACKBODY RADIATION

Φ standing modes in a cavity



$0 \leq n < 1$
(no stable mode)

$n = 1$

$n = 2$

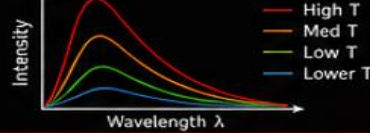
$n = 3$

$n = 4$

BELOW THRESHOLD
 $0 \leq n < 1$
Cavity agitation exists but no stable mode can form.
No radiation.

$n \geq 1$
Discrete cavity modes radiate.
Spectrum begins at $n = 1$.

OBSERVED:
Blackbody spectrum with temperature-dependent intensity (Planck / Wien laws)



EQUATION:
 $\lambda_n = \frac{2L}{n}$ ($n = 1, 2, 3, 4, \dots$)

Only integer n harmonics fit and persist in the cavity.
 $n = 1$ is the lowest radiating mode.

3 PLANCK QUANTISATION

Φ standing mode transitions in a bound oscillator



BELOW THRESHOLD
 $0 \leq n < 1$
System remains in ground state.
No radiation.

$n \geq 1$
Transitions occur only between integer levels.

OBSERVED:
Energy quantised:
 $E_n = n h \nu_1$ ($n = 1, 2, 3, 4, \dots$)

EQUATIONS:
 $E_n = n h \nu_1$
 $\Delta E = h \nu$ ($n_i \rightarrow n_f$)

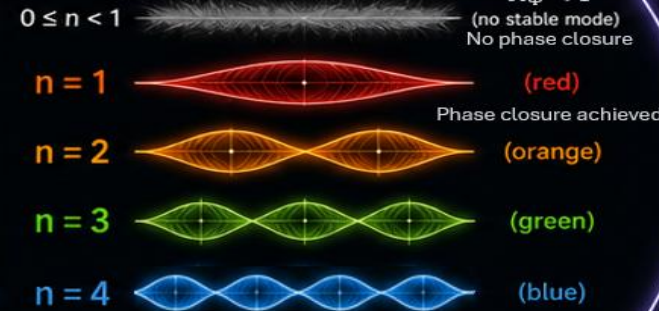
EXTREME CLOSE-UP: Φ RESONANCE-LOCK MODES

Standing scalar field harmonics (same in all phenomena)

$\mathcal{R}_\Phi = 1$

BELOW THRESHOLD
 $0 \leq n < 1$
No stable resonance-lock.
No phase closure.
No persistence.
No observable event.

THRESHOLD REACHED
 $n = 1$
First stable mode appears.
Events begin.



Phase closure condition:
 $2\pi n = n \lambda \Phi$
Only integer n modes are stable.
All others dephase and cancel.

THE UNIVERSAL MECHANISM

Boundary / potential well conditions

Φ supports standing wave solutions

Phase closure selects integer harmonics

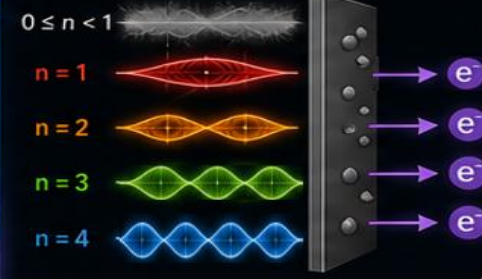
Discrete, stable states emerge

Energy exchanged only between allowed states

We observe quanta, lines, shells, thresholds

2 PHOTOELECTRIC EFFECT

Incident Φ harmonics on a metal surface



$0 \leq n < 1$

$n = 1$

$n = 2$

$n = 3$

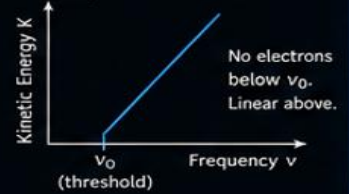
$n = 4$

BELOW THRESHOLD
 $0 \leq n < n_{crit}$
Mode energy too low.
No electron emitted.

$n \geq n_{crit}$
Electron emitted when mode energy exceeds work function.

OBSERVED:
Threshold frequency, kinetic energy
 $K = h \nu - W$, immediate emission

EQUATION:
 $h \nu_n = n h \nu_1$
 $K = n h \nu_1 - W$ for $n \geq n_{crit}$
 $K = 0$ for $n < n_{crit}$



4 ATOMIC STABILITY (BOHR SHELLS)

Electrons in phase-closed matter- Φ resonance shells

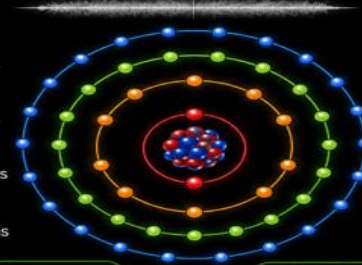
$0 \leq n < 1$

$n = 1$
2 electrons

$n = 2$
8 electrons

$n = 3$
18 electrons

$n = 4$
32 electrons



BELOW THRESHOLD
 $0 \leq n < 1$
No phase-closed orbit.
Electron collapses / dephases.

$n \geq 1$
Only integer n shells are stable and non-radiating.
Electron does not radiate in these states.

OBSERVED:
Discrete stable shells, no classical collapse, discrete spectral lines (Lyman, Balmer, etc.)

EQUATIONS:
 $2\pi r_n = n \lambda \Phi$ ($n = 1, 2, 3, 4, \dots$)
 $L_n = n \hbar$

ONE ALL-PERVADING SCALAR FIELD. ONE RESONANCE-LOCK PRINCIPLE. FOUR MAJOR PHENOMENA.



Unifies thermal, electromagnetic, quantum and atomic phenomena



Recovers Planck's constant h from resonance boundary conditions



Provides physical cause for quantisation, thresholds, spectral lines and atomic stability



Reproduces all known experimental results with high precision



Extends naturally beyond the Einstein regime

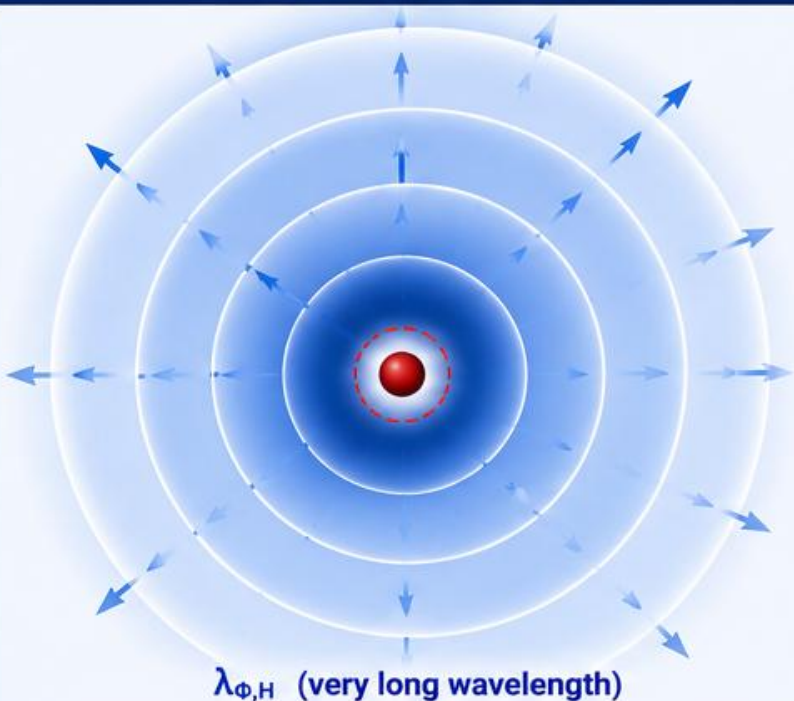
THE DISCRETE STRUCTURE OF NATURE IS THE FOOTPRINT OF SCALAR RESONANCE AND PHASE CLOSURE.

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Nuclear Density Defines Characteristic Resonance Scale

A. HYDROGEN (^1H)

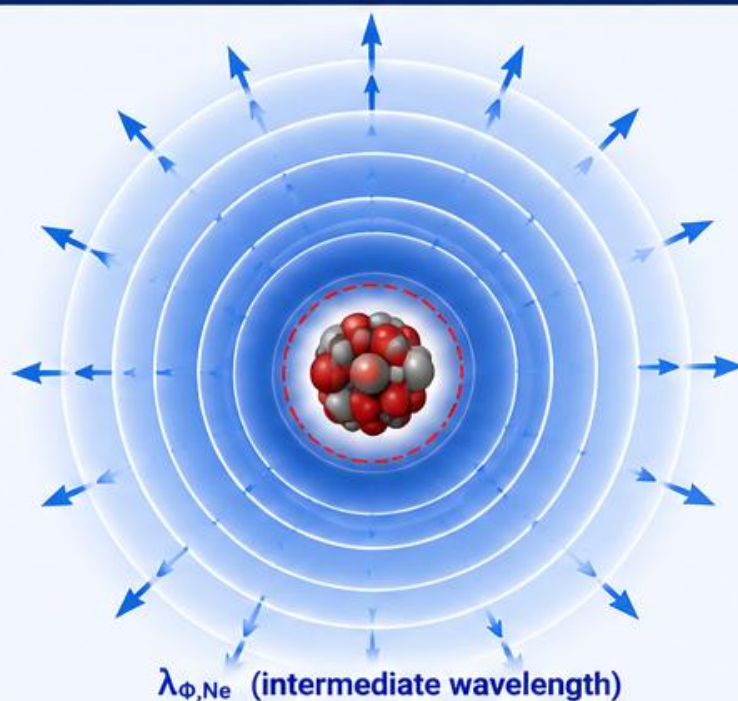
Very low nuclear density
Very long characteristic wavelength



Nuclear composition: 1 proton
Approx. mass-energy density Σ_N : **Very Low**
Resulting resonance scale: **Very Long**
Relative node spacing: **Very Wide**

B. NEON (^{10}Ne)

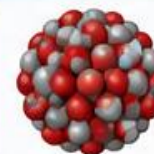
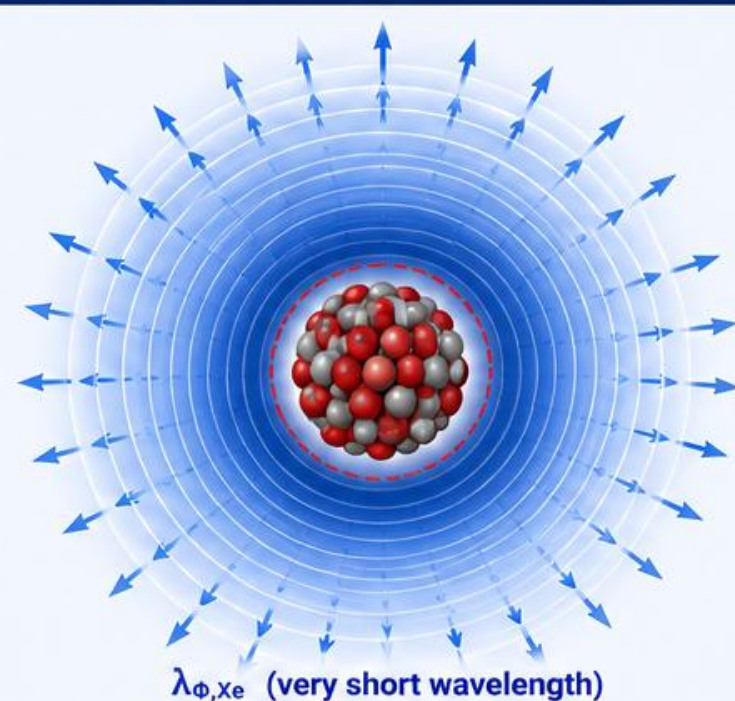
Intermediate nuclear density
Intermediate characteristic wavelength



Nuclear composition: 10 protons, 10 neutrons
Approx. mass-energy density Σ_N : **Medium**
Resulting resonance scale: **Medium**
Relative node spacing: **Moderate**

C. XENON (^{132}Xe)

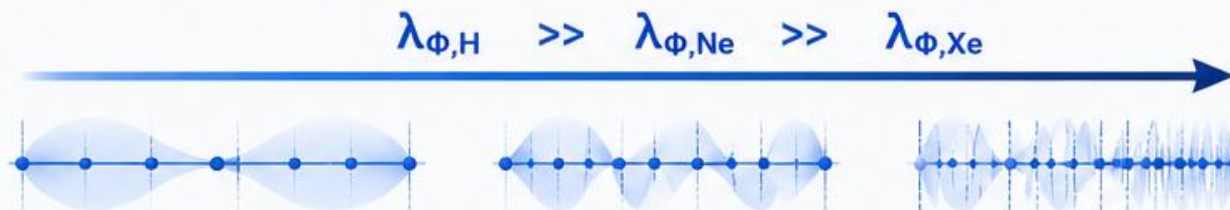
Very high nuclear density
Very short characteristic wavelength



Nuclear composition: 54 protons, 78 neutrons
Approx. mass-energy density Σ_N : **Very High**
Resulting resonance scale: **Very Short**
Relative node spacing: **Very Tight**

COMPARISON OF RESONANCE SCALES

Increasing nuclear mass-energy density produces progressively shorter characteristic wavelengths in Φ .



Φ Expansion Vector
(Direction of natural field expansion)



Nuclear Boundary
(Expansion suppressed within matter)



Holland-Field Tension Gradient
(Dark = high tension, suppressed expansion)

GETT predicts the Periodic Table atomic-radius scaling with $R^2 = 0.976$

GOVERNING EQUATION

$$R_{HA,b} = \lambda_b \cdot n^{\beta_b} \cdot A^{-1/2} \cdot S_E \cdot D_e$$

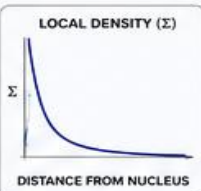
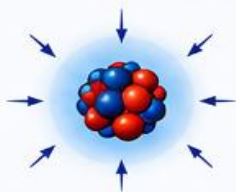
Where:

- λ_b Block-dependent standing-wave scale coefficient (s, p, d, f)
- n^{β_b} Period-based resonance term (shell opening)
- $A^{-1/2}$ Nuclear mass-loading term — proxy for GETT disruption density $\Sigma_\oplus$
- S_E Switch E radius-response factor (≤ 1 ; includes Group 1/2 / T_{n2} transition)
- D_e Electronic loading factor — charge-density constitutive law (not an empirical correction)

THE HOLLAND ATOM

Five Constitutive Elements of the Geometric Radius Scaling Law

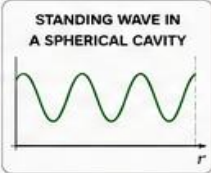
1 NUCLEAR DENSITY LOADING



The nucleus disrupts the surrounding Holland Field, raising the local density that anchors the electron resonance shells.

More nuclear mass/charge
→ higher local density Σ

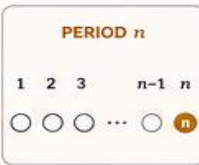
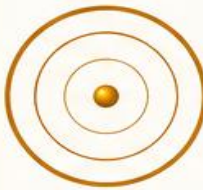
2 QUANTISED STANDING WAVES



Electron resonance shells are standing-wave solutions of the Holland Field, quantised by boundary conditions into discrete shells ($n = 1-7$).

Shells are set by wave physics
→ discrete allowed radii

3 PERIOD-BASED RESONANCE SHELL n



Each period n is a distinct resonance shell. The outermost shell (highest n) defines the equilibrium radius of the atom.

Higher shell number n
→ larger radius (shell opening)

4 SWITCH E — HIGH-DENSITY COUPLING



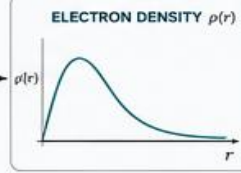
HIGH DENSITY (INNER SHELLS)
Stronger coupling
→ stronger equilibrium restoration
→ radius DECREASES
 $S_E \leq 1$

Enhanced Holland-Higgs coupling in the compact inner-shell regime strengthens equilibrium restoration toward the core.

Higher density → stronger coupling
→ smaller radius ($S_E \leq 1$)

Group 1/2 boundary handled as a mode of Switch E (T_{n2}).

5 ELECTRONIC LOADING (D_e)



Local Holland Field density is modulated across each period by the electronic charge-density distribution within the active resonance cavity.

More electronic charge in cavity
→ lower local density → slight radius increase (fine adjustment)

One governing equation, applied across the periodic table, all 118 elements, reproduced atomic-radius scaling with $R^2 = 0.976$. A field-derived geometric law should not have been able to do that by accident.



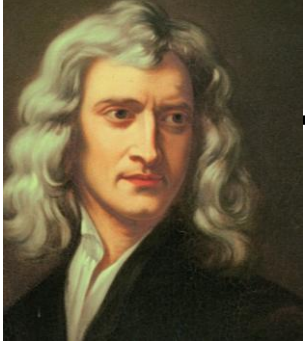
I'm doing what I do best... now I need you.

1. To be **a part of something** which may potentially prove to be **nothing** or could change **everything**.
2. **Try and break it...** I've been unable.
3. Support to **engage the right people**
4. Seeking **endorsement** for **arXiv**
5. Seeking **sponsorship and funding** to continue the research

And most of all...

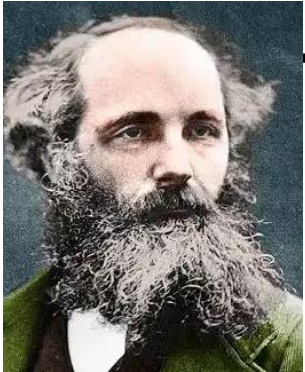
6. A small group willing to **explore the possibility** with me...

Different centuries. Different conceptions. Different physics.
the search for the physical reality beneath the mathematics.



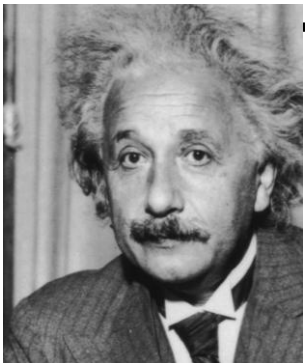
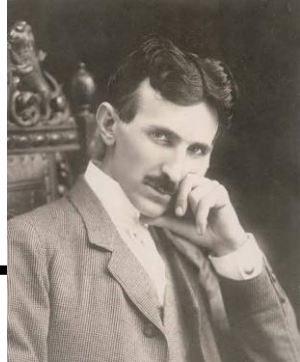
- **Newton** asked whether an all-pervading **aetherial medium**, whose physical state varied around matter, might be responsible for gravity

Faraday came to believe that his lines of force had a **real physical existence**



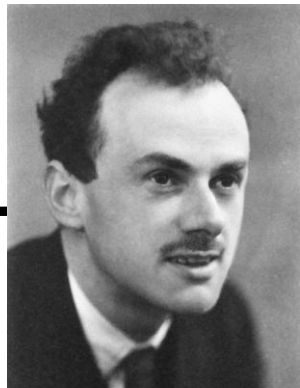
- **Maxwell** asked what physical state of tension and motion in a **medium** could produce the forces that he described mathematically

Tesla spoke of an underlying **medium** filling all space — a **medium** capable of strain, motion, and even connection with the constitution of matter



- **Einstein** asked whether field and matter might ultimately be manifestations of the same **underlying physical reality**

Dirac wrote: “the **Aether** is no longer ruled out by relativity, and **good reasons can now be advanced for postulating an Aether.**”





General Expanse Tension Theory (GETT)

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A physically real, naturally expanding, all-pervading, gauge-invariant singlet scalar quantum field — the Holland Field Φ ...

...which couples to the Higgs sector (“mass”) and other Standard Model sectors, with interaction strengths governed by continuous, density-dependent modulation.

Mass-energy disrupts its local equilibrium configuration, creating field-tension gradients that drive the system toward equilibrium restoration.

And by “*System*”, I refer to The Universe and Everything within it.



General Expanse Tension Theory (GETT)

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Chartered Engineer | 6-Sigma Master Black Belt

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