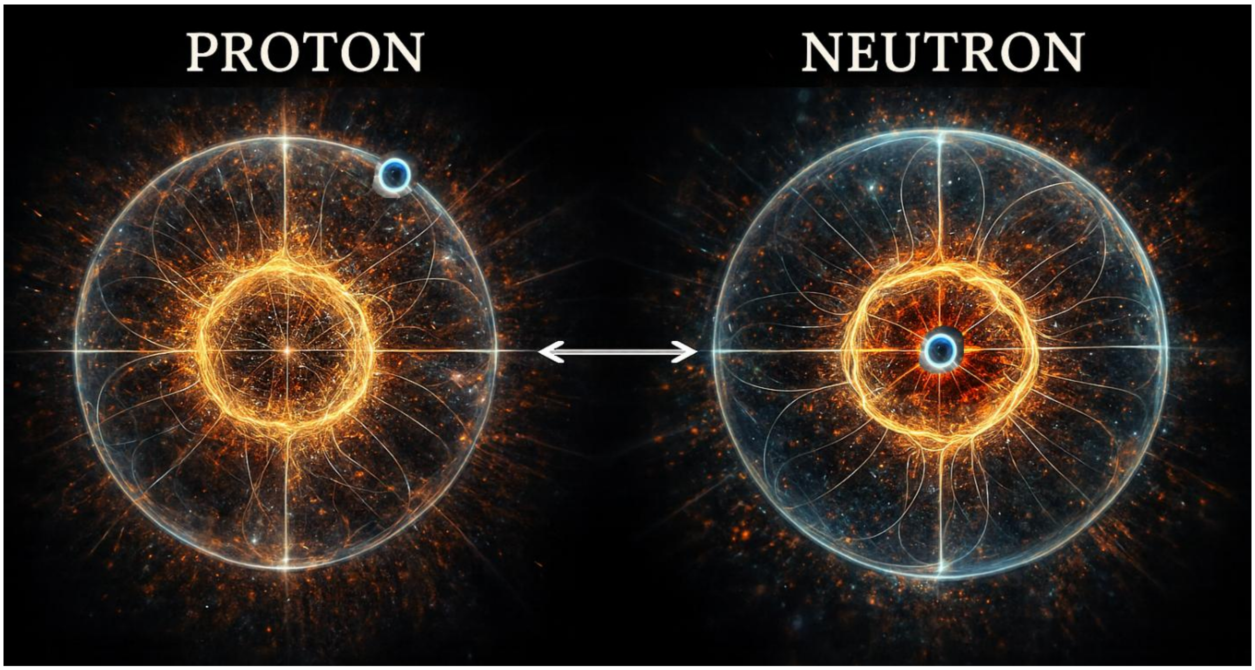
Opening – Publication Plan

Article 2 — About Stability and Decay

Author: Avi Hadar

Affiliation: Xplaner Research

Email: avihadar0577@gmail.com



This article is part of a series of papers that together present a complete field-based reinterpretation of matter. The series is built upon the previously published framework **Field Relativity Framework, Field-Preservation Origin of Relativistic Effects (V1)** and extends it into specific physical domains.

The following papers will be published:

1 Redefining Fundamental Particles as Field Configurations

Redefines the elementary particles (proton, neutron, electron) as field structures, rather than point masses or quantum states.

2 About Stability and Decay

Presents a field-based explanation for particle stability and the mechanisms leading to decay, including neutron breakdown and energy transformation.

3 Electrical Conduction Reinterpreted

Offers a new explanation for electrical conduction, based on field alignment and structural pathways within the material.

4 Forces and Binding Energy

Explores how field interactions give rise to observable forces and binding phenomena in atomic and nuclear structures.

5 Known Fields

Analyzes existing field types (gravitational, electromagnetic, etc.) in light of the field-preservation principle.

Article 2 — About Stability and Decay

As mentioned earlier, stability is the fundamental cornerstone of the universe. This is what matter - electric fields - always seeks: a stable configuration. When an electric field loses stability, it does not disappear or decay; an electric field simply changes its shape. There is no new physical mechanism here. The same process is already known and fully described by Maxwell's equations. What happens on a large scale also happens on an atomic scale - only within a limited area.

According to my theory, which is completely consistent with existing calculations, the decomposition process is part of a natural process of an electric field.

As I mentioned in the previous article, the electric field has two regulation mechanisms, one through a change in permeability and the other through a change in radius. Decay is the case when the change in energy cannot be regulated through permeability, the electric field changes radius, changes configuration from a closed field to a limited open field.

Chapter 18 — Introduction

The electric field of a particle can be imagined as a spherical sprinkler, like a small orb ejecting streams of energy in all directions. In the absence of any opposing forces, such as gravity or external fields, these streams continue to expand outward indefinitely. The field thus fills the surrounding space, extending further and further without bound. This image helps illustrate the idea of a field not as a static zone, but as a dynamic, expansive structure that originates from the particle itself.

If we add to each droplet of water a property that causes it to be attracted toward a central drain, the water jets will begin to curve, each following a path that ultimately leads it to the drain. In this way, the originally expanding pattern becomes organized — forming clear, directed paths. This is how the lines of an electric field appear: not chaotic, but guided by the interaction between the field and surrounding potentials.

An increase in pressure — or in energy — causes the droplets to travel farther, expanding the range of the field. Conversely, a decrease in pressure will shorten the distance the droplets can reach. The trajectory of these droplets, or field lines, is therefore affected by both the amount of pressure and the position of the central drain.

If the drain is located very close to the sprinkler, the droplets will follow a circular path and return to the drain. This creates a closed field — similar to the structure of a neutron. On the other hand, if the drain surrounds the sprinkler from a distance, the droplets will eventually converge toward it, forming an open field structure.

- ### Atomic Space

Atomic space is defined as the envelope formed by electric field lines. Returning to the sprinkler analogy, this is the region in which the droplets are dispersed — a three-dimensional field zone. In atoms composed of multiple nucleons, this space is the result of overlapping fields, not simply the presence of discrete particles.

Each nucleon generates its own field, and when multiple nucleons are nearby, their fields interact and merge, forming a shared spatial domain. Even though the source particles remain point-like, the electric fields they emit occupy and structure the entire atomic space. This is analogous to placing multiple sprinklers close together: each contributes to the shared water pattern, expanding and shaping the total spread.

As more nucleons contribute to the field, density increases. Collisions between field lines (or droplets, in the analogy) become more frequent, and energy is lost due to interference. To counteract this, the atomic space expands — reducing density and minimizing internal collisions. The physical manifestation of this expansion is a shift in the zero point — the central drain — moving farther away. As a result, the field lines curve along longer trajectories through a less congested space.

- ## Atomic Radius

Each field has its own energy equation. All nucleons have a common base radius, denoted R_0, which is exactly half the Bohr radius. This value is constant and does not change, whether the field belongs to a single neutron, to an open field like that of hydrogen, or to a complex atomic structure.

The radius of the full field R—the extent to which the field spreads out—is equal to twice R_0, or the full Bohr radius, in its standard state. This R can expand to accommodate additional energy, or contract when energy is released. However, R_0 remains constant in all cases.

In protons, as energy increases, the radius R increases to maintain balance. This flexibility allows energy to be absorbed through spatial expansion. Neutrons, on the other hand, lack this adaptability: their radius R cannot change. And what if the energy in the neutron is too high? Then it must change configuration.

- ## Permittivity

The energy coefficient refers to the ability of space - or matter - to allow the passage of an electric field. It controls the extent to which a field can penetrate and propagate through a medium. A higher energy coefficient reduces the strength and spread of the electric field; a lower energy coefficient allows the field to spread more strongly and reach further.

This coefficient has a lower threshold, it is the permittivity coefficient in a vacuum. It has no upper threshold. I will elaborate later on how the thresholds are determined.

- ## Atomic Pressure

Atomic pressure is an internal factor that exists within an atom. It reflects the enormous energy density within a confined space. The pressure within an atomic structure can reach levels far exceeding those found in conventional materials or environments. The standard pressure equation for an electric field is:

$$P = \frac{\varepsilon_0 E^2}{2}$$

where (E) is the electric field intensity and (ε_0) is the vacuum permittivity constant.

- ## Atomic Frequency

We begin with the assumption that the universal radius R_0

is a fundamental constant shared by all nucleons. This means that the positive charge — which creates the confined electric field — always moves along this same fixed radius. Since a stable circular motion at a fixed radius requires a specific constant velocity, the motion of the positive field occurs at a fixed speed. Consequently, the frequency of rotation is also fixed:

$$f = \frac{v}{2\pi R_0}$$

This defines a universal, intrinsic frequency for any confined positive field.

To determine the actual value of this frequency, we use a known experimental measurement: the **Larmor frequency of the neutron**, which is:

$$\boldsymbol{f_n = 29.1646943}\ \textbf{MHz}$$

This frequency is measured as the magnetic resonance of the neutron, but since the magnetic field is produced by the rotating electric field, and both fields must remain in harmonic synchronization, we identify this as the **true frequency of the internal electric field**. This gives us the base frequency f_n

that can be used for further calculations — for example, in resonance interactions or frequency multiplications involving atomic structures.

Chapter 19 — Energy Management in the Nucleus

As discussed earlier, an atom has two main mechanisms for managing energy:

1. **Energy Modulation** – a continuous response mechanism that allows an atom to gradually absorb and release energy.
2. **Discrete Radius Shift** – a threshold-based mechanism that is triggered when the field crosses a certain threshold, leading to a sudden change in the atomic structure.

In the proton, both mechanisms are naturally available. It can change its radius, which allows transitions between discrete energy levels. This flexibility allows it to manage accumulated energy both continuously (via energy modulation) and discretely (via radius).

In contrast, the neutron cannot change its radius. As a result, it relies solely on changes in energy modulation to absorb or release energy. This fundamental difference means that over time, energy accumulates within protons that have the ability to store it through changes in radius.

When a polynuclear atom experiences energy input: - All nucleons absorb energy uniformly through changes in energy coefficient. - The permittivity range for protons is defined around a field value of about 0.5, while for neutrons it extends to about 0.78. - As energy accumulates, protons first reach the limit of their permittivity range.

At this point: - The protons increase their radius, which – according to the field equation – reduces the permittivity back to a higher initial value. - The neutrons, still confined to the same radius, remain at a lower permittivity.

Then, a natural exchange occurs: - The neutrons begin to release energy by increasing their permittivity. - Nearby protons absorb some of this released energy. - The system gradually equilibrates as the values of the permittivity coefficient over all nuclei converge again.

When energy release is required: - The proton radius is reduced, and the permeabilities within it equilibrate. - In neutrons, the permeabilities remain high at first, and again a process of permeabilities equilibration occurs. - Here it is important to emphasize that protons need to release energy in order to equalize permeabilities, increasing the permeabilities, while neutrons absorb energy and reduce the permeabilities.

A point to ponder: what happens if, due to the energy release, the proton needs to drop another level?

Chapter 20 — Frequency and Magnetic Field

Decay is understood here as a physical transformation in the field configuration: a transition from a **confined** electric field (stable neutron) to an **open** field structure (proton and emitted energy). This transition is triggered when the confined field can no longer maintain its radius — typically due to permittivity reaching a physical limit.

From observation, it is known that a particle — the **anti-neutrino** — is released during the process. This indicates a well-defined physical event: the confined neutron collapses, transforms into a proton, and emits a quantized magnetic energy packet. The model assumes this released magnetic energy originates from the field itself as it undergoes reconfiguration.

The root cause of collapse is the demand for a radius expansion that the confined field can no longer resist. As energy accumulates internally, permittivity drops to its minimum possible value. At this threshold, the field has no further means of compression — and a structural change becomes inevitable.

In the following steps, we will: - Identify the **permittivity threshold** that initiates collapse - Calculate the **magnetic field strength** associated with the transformation - Show that the **frequency** required to generate this field is precisely the frequency that accumulates this energy over 880 seconds

These are the focus of the three steps that follow.

- ## Permittivity Threshold At the initial state

, the confined electric field is accompanied by an internal negative field — with energy of 0.782 MeV — which offsets the total energy. To preserve stability, the system must raise its permittivity accordingly to maintain the correct balance and prevent premature collapse.

The electric field equation:

$$E = \frac{Q^2}{8\pi\varepsilon R}$$

Let us compute the required permittivity under two conditions:

1. **Without** internal negative field (full energy):

   $$E = \frac{(1.33 \times 10^{-15})^2}{8\pi\varepsilon R} = 14.1\ \text{MeV}$$

   Solving for

   $$\varepsilon$$

   :

   $$\varepsilon = \frac{(1.33 \times 10^{-15})^2}{8\pi RE}$$

Using

$$E = 14.1\,\text{MeV} = 2.26 \times 10^{-12}\,\text{J}$$

and

$$R = 5.29 \times 10^{-11}\,\text{m}$$

:

$$\varepsilon_{full} \approx 7.06 \times 10^{-11}\,\text{F/m}$$

2. **With** negative internal energy of 0.782 MeV:

$$E = 13.318\,\text{MeV} = 2.13 \times 10^{-12}\,\text{J}$$

$$\varepsilon_{reduced} \approx 7.49 \times 10^{-11}\,\text{F/m}$$

This shows that the required permittivity increases due to the negative field:

$$\Delta\varepsilon \approx 0.43 \times 10^{-11}\,\text{F/m}$$

Relative increase:

$$\frac{\Delta\varepsilon}{\varepsilon_{full}} = \frac{0.43}{7.06} \approx 6.1\%$$

Thus, the permittivity change required for stability is minimal — only about 6% above the base value — illustrating the high sensitivity and delicate balance of the confined field system.

As additional energy accumulates, permittivity is gradually reduced in response. However, this reduction has a lower limit: the minimal physical value of permittivity. Once this minimum is reached, the confined field can no longer adapt by compression, and the only path forward is a structural transformation. This manifests as the release of energy and the decay event observed.

• Required Magnetic Field Energy

Here, we calculate the magnetic field required to generate an energy packet large enough to force permittivity back to its minimum threshold. This is the exact energy level needed to initiate the structural collapse of the confined field.

Given total magnetic energy:

$$E = 0.782\,\text{MeV} = 1.25 \times 10^{-13}\,\text{J}$$

Assuming a confined positive electric field with radius:

$$R = R_0 = a_0 \approx 5.29 \times 10^{-11} \text{ m}$$

This value — the full Bohr radius — defines the intrinsic core boundary of a stable electric field in this model.

Volume of the confined region:

$$V = \frac{4}{3}\pi R^3 \approx 6.20 \times 10^{-31} \text{ m}^3$$

Energy density:

$$u_B = \frac{E}{V} \approx 2.02 \times 10^{17} \text{ J/m}^3$$

Magnetic field magnitude:

$$B = \sqrt{2\mu_0 u_B} \approx 7.12 \times 10^5 \text{ T}$$

This is the precise field strength that must be generated to bring the permittivity back down to its lower limit.

• Neutron Field Dynamics — Full Derivation

a. Assumption About the Frequency

The core assumption is: The neutron has a known Larmor frequency:

$f_n = 29.1646943$ MHz

This value is taken as the **intrinsic rotation frequency of the neutron's internal electric field**.

---

b. Number of Cycles in 880 Seconds

The neutron lifetime is:

880 s

Number of cycles:

$N = f_n \cdot 880$

$N = 2.91646943 \times 10^7 \cdot 880$

$N = 2.566492 \times 10^{10}$

---

c. Required Magnetic Field for Collapse

The required magnetic field derived earlier:

$B_{\text{required}} = 7.12 \times 10^5$ T

This is the critical internal magnetic field at which the neutron becomes unstable.

---

d. Interpretation of the Accumulation

The neutron does **not** begin with this magnetic field.

There is an internal base field, and on every cycle a **small additional magnetic contribution** is added.

Total accumulation after N cycles must reach:

B_{required}

Thus:

$B_{\text{required}} = N \cdot \Delta B$

Solving for the contribution per cycle:

$\Delta B = \frac{B_{\text{required}}}{N}$

$\Delta B = \frac{7.12 \times 10^5}{2.566492 \times 10^{10}}$

$\Delta B = 2.774 \times 10^{-5}$ T per cycle

---

e. Physical Interpretation

The small magnetic increment per cycle, (B), corresponds to:

A **small decrease in permittivity** ( ) of the neutron's internal field.

Each cycle adds energy to the confined electric field.

To contain the added energy, the permittivity must decrease slightly.

Because the magnetic field depends on the electric field configuration and the permittivity, the magnetic field shifts by a small amount.

These shifts accumulate over the full 880 seconds until the magnetic field reaches the critical value.

Thus, the mechanism is:

- Electric field oscillates at constant frequency (f_n).
- Each oscillation adds a small energy increment.
- Permittivity decreases to accommodate the new energy.
- Magnetic field feels this as a small positive increment.
- After ($2.566492 ^{10}$) cycles the system reaches the collapse threshold.

This connects:

- The neutron's measured internal frequency.
- The collapse time of 880 seconds.
- The critical magnetic field.
- The idea that permittivity reduction drives magnetic field buildup.

No additional assumptions beyond these relations are introduced.

Chapter 21 — Confinement Without Repulsion

One of the core challenges in any field-based model of matter is the following paradox:

How can two positively charged protons exist in extremely close proximity without experiencing immense repulsion — on the order of hundreds of keV or more?

According to classical field equations, such proximity should require tremendous energy input. Yet in stable nuclei, protons sit at distances much smaller than the Bohr radius. The field-based interpretation must therefore offer a mechanism that naturally prevents repulsion — not by counteracting it, but by eliminating its cause.

- ### The Classical View — and Its Flaw

In isolated conditions, a proton generates a positive electric field whose zero point lies at the outer edge of the field. This creates a radial, outward-pushing field that naturally leads to electrostatic repulsion when two protons are brought near one another.

This is the classical picture: a particle-centric view where each proton emits its own open field, and any attempt to compress these fields into nuclear distances results in massive energy costs.

But this picture breaks down inside the nucleus.

- ## The Neutron-Centered Space

In nuclear space — a domain not of isolated particles but of overlapping fields — the situation is fundamentally different.

Each neutron defines a confined electric field, centered around a zero-point located deep within its structure. This “0” is not on the periphery, but at the center of the field geometry.

Now, when a proton is present within that space, something dramatic happens: The central 0-point of the neutron is spatially close to the proton’s charge. This proximity alters the geometry of the proton’s field.

Instead of forming a wide, open field with a distant zero — the proton’s field becomes confined around the same central point as the neutron’s.

This shift is not internal to the proton — it is imposed by the shared geometry of space.

- ## From Open Field to Confined Field

In this configuration, the proton’s field no longer emits outward as a radial repulsive force. It behaves instead like a confined field — just like the neutron.

And a confined field does not create outward repulsion. Its energy loops internally around the central point. Its structure becomes stable, non-expanding, and non-repelling.

Thus:

The repulsive force disappears

Not because of a counter-force

But because the field has fundamentally changed form

- ## The True Resolution

This is the key insight:

Protons in the nucleus do not generate open fields. They reside inside a nuclear space already shaped by confined fields — the neutrons. The presence of central zero-points redefines the entire spatial structure, forcing even positive charges to emit confined, non-repelling fields.

There is no need to invoke unknown forces or particle exchanges. The apparent paradox of "bringing protons together" dissolves when one abandons the particle model and adopts the field geometry fully.

Repulsion does not need to be overcome — because in the presence of central 0-points, repulsion never arises.

Chapter 22 — Formation of an Elemental Atom

This section describes, step by step, the physical process by which an elemental atom emerges through the decay and stabilization of a neutron cluster. The atom is not assembled from components and is not the result of particle aggregation. Instead, it forms naturally as a consequence of field reconfiguration driven by balance conditions that arise within the cluster space itself.

The process described here is purely physical. No new interaction mechanisms are introduced, and no assumptions beyond field behavior, force balance, and spatial constraints are required. This section does not address the question of stability or the conditions under which a proton decays; such decay is taken as a given starting condition for the process described here.

At the moment a proton is formed, the center of its electric field is, by default, located at the center of the space as it existed prior to the decay. From this initial position, the proton does not choose its location arbitrarily; it moves in response to the physical forces acting upon it within the space. Its subsequent displacement and final position are therefore determined entirely by the balance of forces present at each stage of the process.

- ### Initial State – Neutron Cluster

The starting point is a neutron cluster that detaches from a larger parent cluster. This detached cluster may contain hundreds of neutrons. Once separated, a distinct spatial domain is formed. This domain represents the total energy stored within the cluster and defines the space in which all subsequent processes occur.

Within this shared space, the electric fields of the neutrons coexist. Their charge distribution and their zero-points are all located at the center of the space. At this stage, the structure is symmetric, confined, and stable, with no protons present.

- ### Stage 1 – Onset of Neutron Decay and First Proton

Neutron decay begins within the cluster. The first proton that forms places the center of its electric field at the center of the shared space. When referring to the proton's position, it is specifically the center of its electric field that is meant.

The electric field of this proton expands throughout the entire domain, filling the available space and forming a positive envelope. This envelope defines the initial field structure of the emerging atomic space.

- ### Stage 2 – Second Proton and Axial Stabilization

A second proton forms as decay continues. Initially, the center of its electric field is located near the spatial center. Mutual electrostatic repulsion between the two protons causes them to move apart.

As they separate, both protons remain bound to the shared central zero-point of the space. The result is a symmetric configuration in which the two protons settle on opposite sides of the center. An equilibrium is reached between the repulsive force each proton experiences from the other and the attractive influence of the shared central zero.

This configuration corresponds to the helium atom: a space containing two protons arranged symmetrically along an axis, with no rings present.

- ### Stage 3 – Formation of the First Ring Proton

As decay continues, a third proton is created. Initially, the center of its electric field lies close to the center of the space. Because the two axial protons are symmetrically positioned, the third proton experiences equal repulsive forces from both sides, maintaining symmetry with respect to the axis.

At the same time, the proton experiences repulsion from the center of space and from the positive envelope formed earlier. These combined effects cause it to move outward from the center.

The proton continues to move until it reaches a position where all acting forces are balanced: repulsion from the axial protons, repulsion from the center, and repulsion from the envelope. At this equilibrium radius, the proton cannot remain static. Instead, it enters circular motion around the axis.

This marks the initiation of the first proton ring.

- ### Stage 4 – Completion of the First Ring Pair

A fourth proton forms and undergoes the same process as the first ring proton. Its electric field center initially lies near the spatial center, and it is repelled by the axial protons, the center, the envelope, and the existing ring proton.

The position of force balance is located opposite the first ring proton, on the other side of the spatial center. The two protons settle in diametrically opposed positions and enter circular motion around the axis.

At this point, a symmetric two-proton ring has formed around the central axis.

- ### Stage 5 – Ring Filling and Saturation

Neutron decay continues, producing additional protons. Each newly formed proton follows the same physical process: initial proximity to the center, outward motion driven by repulsion, and eventual settlement at a position of total force balance.

Each proton that reaches this equilibrium radius enters circular motion and joins the existing ring. As more protons are added, the ring fills progressively.

When the ring reaches eight protons, it attains an energetically optimal configuration. At this point, no additional protons can be accommodated within the same ring. Any further addition would disrupt the established balance of forces.

- ### Stage 6 – Emergence of a Second Ring

When a new proton forms after the first ring is complete, it cannot join the saturated ring. Instead, it positions itself adjacent to the existing ring structure.

Mutual repulsion between the new proton and the filled ring causes a rearrangement. The ring and the new proton shift relative to the center, settling on opposite sides of the spatial center.

This rearrangement results in the formation of a second ring around the same axis, distinct from the first.

- ### Stage 7 – Noble Gas Configuration

As decay proceeds, the second ring is completed. The two rings arrange themselves along the axis at equal distances from the spatial center.

At these positions, equilibrium is achieved through a balance of forces: repulsion from the center, mutual repulsion between the rings, and repulsion from the positive envelope. This configuration is highly stable and corresponds to a noble gas state.

- ## Stage 8 – Central Ring Formation (Iron)

Further decay leads to the formation of an additional ring.

Once this third ring is completed, the system reaches a stable configuration corresponding to iron.

- ## Stage 9 – Failure of Central Ring Formation

Beyond this point, a new behavior appears. A newly formed proton is unable to establish a new ring at the center.

Repulsion from the existing rings drives the proton outward. It settles in a region between the central ring and the positive envelope, instead of forming a new ring.

- ## Stage 10 – Ring Repulsion and Space Formation

An additional proton joins the proton located in the outer region, forming an outer ring. This configuration generates a field at the center that repels the existing rings.

As a result, the rings shift outward from the center. This movement creates a new internal spatial region where further ring formation becomes possible.

- ## Stage 11 – Ruthenium Configuration

The process of ring formation continues according to the same principles until the element ruthenium is reached.

At this stage, a phenomenon previously observed reappears. The next two protons do not initiate a new ring. Instead, they join the outer ring, bringing the total number of protons in that ring to four.

This redistribution once again creates internal space, enabling the formation of additional rings.

- ## Stage 12 – Continuation Across the Periodic Table

From this point onward, the same physical process continues. Rings form, redistribute, and stabilize according to spatial constraints and force balance.

This progression proceeds until the maximum spatial capacity of the system is reached. Through this single continuous mechanism, the full domain of elements across the periodic table is generated.

Chapter 23 — Neutron stability

At the present stage of this work, a definitive physical cause for neutron instability and decay **inside an atom** has not yet been identified.

The decay mechanism previously discussed, based on the gradual buildup of an internal magnetic field through harmonic accumulation, does **not** appear to fully account for neutron decay in atomic environments. According to the examinations carried out so far, and acknowledging that these results may still be incomplete, only a **very small external electric disturbance** seems sufficient to disrupt the harmonic balance from which magnetic-field growth and decay would otherwise emerge.

This observation suggests that neutron stability inside an atom may be governed by additional constraints that are not captured by the magnetic-accumulation mechanism alone.

At this stage, two possible physical explanations remain open.

- ### Permittivity-Based Instability

One possibility is that neutron stability depends on the **permittivity balance within atomic space**. In this view, stability is influenced by the ratio between protons and neutrons, as well as by the spatial distribution of protons relative to the neutron-centered core of the atom.

Neutrons are concentrated near the center of atomic space, while protons occupy positions distributed around them. If the absorption of energy by protons is not sufficiently rapid, the permittivity of the neutron fields may decrease.

If this reduction exceeds the allowed physical range, neutron decay becomes unavoidable. The process is halted once energy transfer within the atom restores a stable permittivity distribution, allowing the system to re-equilibrate.

- ### Influence of the Internal Negative Field

A second possibility involves the **negative field component within the neutron**. As the number of protons increases, a growing fraction of electric field lines are drawn inward toward the neutron-centered zero-point.

This inward-directed field contribution modifies the internal negative field of the neutron, strengthening it and expanding the permissible permittivity range. Beyond a certain threshold, this expansion allows the neutron to maintain stability.

In this scenario, neutron stability is not achieved by suppressing decay mechanisms, but by enlarging the internal tolerance range of the neutron field itself.

- ### Current Status

At present, no single explanation can be confirmed as the definitive cause of neutron stability or decay within atomic structures. Both mechanisms remain physically plausible and are the subject of ongoing investigation.

Further analysis is required to determine whether one of these mechanisms dominates, or whether neutron stability emerges from a combined effect of both.

Chapter 24 — Summary and Conclusions

This chapter, together with the preceding chapters—*Redefining the Fundamental Particles*—establishes a complete and self-consistent framework for a physics based entirely on electric fields, as defined within this theory.

Within this framework, no additional fundamental interactions are required. There is no need to invoke a strong force or a weak force, and no particles are assumed to disappear or emerge through non-physical mechanisms. All observed phenomena described here arise from continuous, deterministic field behavior governed by classical field equations.

Matter is treated throughout as structured electric fields. Stability, decay, confinement, and transformation are explained as changes in field configuration, geometry, and balance conditions, not as particle-level events or probabilistic processes.

The framework developed up to this point demonstrates that a wide range of nuclear and atomic phenomena can be addressed using pure field physics alone, without introducing auxiliary forces or abstract constructs beyond measurable field quantities.

Across the preceding sections, several key results have been established. Stability is shown to be a consequence of field equilibrium rather than an intrinsic particle property. Decay is described as a structural field transformation driven by limits in permittivity and spatial confinement, not as a stochastic or probabilistic event. Nuclear confinement is achieved through field geometry, eliminating electrostatic repulsion without invoking compensating forces. The formation of elemental atoms is presented as a continuous, deterministic process emerging naturally from neutron decay and field balance within shared atomic space.

Importantly, this work does not claim that all open questions have been resolved. In particular, neutron stability within atomic environments remains an active subject of investigation. Two physically grounded mechanisms have been identified as plausible contributors, but a definitive determination has not yet been reached. This uncertainty does not weaken the framework; rather, it defines a clear boundary between what has been established and what remains to be examined.

Taken together, Articles 1 and 2 provide a coherent physical foundation for a field-based description of matter. They demonstrate that many phenomena traditionally attributed to additional forces or abstract particles can be reinterpreted as direct consequences of electric field structure, interaction, and equilibrium. Further work will build upon this foundation, extending the framework into additional domains while maintaining the same commitment to physical clarity and minimal assumptions.

Appendix A — Fundamental Field Constants and Parameters

Base field radius (universal nucleonic constant)

$$R_0 = \frac{a_0}{2} = 2.645 \times 10^{-11}\ \mathrm{m}$$

Open-field radius (hydrogen ground state)

$$R = a_0 = 5.29 \times 10^{-11}\ \mathrm{m}$$

Positive field charge

$$Q = 1.33 \times 10^{-15}\ \mathrm{C}$$

Intrinsic nucleon frequency

$$f_n = 29.1646943\ \mathrm{MHz}$$

Vacuum permittivity (lower physical bound)

$$\varepsilon_0 = 8.8541878128 \times 10^{-12}\ \mathrm{F \cdot m^{-1}}$$

Minimal physical permittivity threshold

$$\varepsilon_{\min} \approx \varepsilon_0$$

Neutron lifetime (reference value)

$$\tau_n \approx 880\ \mathrm{s}$$

Electron energy (zero-field component)

$$E_e = 0.511\ \mathrm{MeV}$$

The electron is modeled as a zero-potential field (return flux), not an independent energy source. It defines either a field boundary or internal zero-point.

Appendix B — Core Field Energy and Stability Equations

Confined electric field energy

$$E = \frac{Q^2}{8\pi\varepsilon_0 R_0}$$

Open field energy (radius-dependent)

$$E(R) = \frac{Q^2}{8\pi\varepsilon_0}\left(\frac{1}{R_0} - \frac{1}{R}\right)$$

Field pressure (energy density)

$$u = \frac{\varepsilon_0 E^2}{2}$$

Lorentz-type radius relation (from field preservation)

$$R = R_0\sqrt{1-\frac{v^2}{c^2}}$$

Magnetic energy density

$$u_B = \frac{B^2}{2\mu_0}$$

Mass–field equivalence (conversion formula)

$$\boxed{mc^2 = \frac{Q^2}{8\pi\varepsilon_0 R_0}}$$

Open-field expansion from mass (derived radius)

$$\boxed{R = \left(\frac{1}{R_0} - \frac{8\pi\varepsilon_0 mc^2}{Q^2}\right)^{-1}}$$

These equations form a closed and testable foundation for relating energy, radius, and structure.

Appendix C — Correspondence Between Standard and Field-Based Physics

Standard Concept	Field-Based Description
Mass	Confined field energy
Particle	Electric field configuration
Electric charge ±	Positive field + zero-point
Lorentz contraction	Field preservation
Relativistic mass increase	Field energy density increase
Schrödinger equation	Field-energy evolution equation
Probability amplitude	Field intensity
Strong force	Confined field geometry
TOV equation	Field-pressure equilibrium
