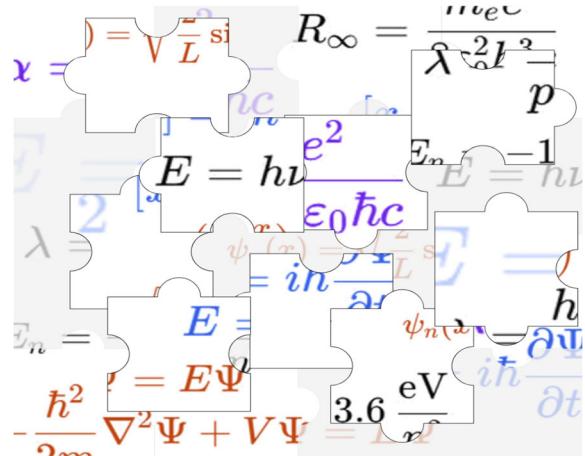


# PART I - CAN THREE SIMPLE LAWS EXPLAIN QUANTUM PHYSICS?

## Quantum Mechanics: An Incomplete Puzzle

While Quantum Mechanics stands as one of the greatest intellectual triumphs in human history it remains stubbornly immune to revealing its inner secrets. Constructed from abstract mathematical frameworks—wavefunctions, probability amplitudes, and an “uncertainty principle”—quantum mechanics is conceptually fragmented. Although it provides us with extraordinarily accurate predictions, familiar questions are left unanswered:



1. Why does measurement seemingly cause wavefunctions to collapse?
2. What is the physical basis for quantization of energy levels in atoms?
3. What explains the wavefunction and its probability interpretation?
4. Why do fundamental physical constants have their specific measured values?
5. How does wave-particle duality arise?
6. What explains quantum entanglement and instantaneous correlations at distance?
7. What is the physical explanation for the uncertainty principle?
8. How is quantum superposition explained?

These gaps have suggested to physicists that quantum mechanics is part of a more fundamental structure—a large puzzle still missing crucial pieces. Historically, physicists have sought a more elegant, intuitive framework, and wave-based approaches have been conceptually alluring. However, previous wave-based theories (such as pilot-wave theories or classical ether models) failed to gain widespread acceptance due to their inability to align fully with experimental results or to reconcile with the successes of relativity.

## What is Quantum Wavespace Theory (QWST)?

Quantum Wavespace Theory (QWST) proposes that all physical phenomena—from the subatomic to the cosmic—arise from resonant, self-sustaining waves within a single, dynamic continuum: quantum wavespace. Unlike standard quantum mechanics, which treats particles as probabilistic entities, QWST views them deterministically as stable wave patterns sustained by resonance. In this framework, mass, charge, and fundamental properties are no longer inexplicable givens but rather natural outcomes of wave resonance conditions.

Harry Walter Schmitz, my father, dedicated his life to developing his hypothesis, completing his manuscript *The Physical and Philosophical Nature of the Universe* shortly before his untimely passing in 1979. His “conceptual analysis” is vast in scope, adeptly describing physical phenomena at both cosmological and nuclear scales. His hypothesis details the evolution of our universe, revealing elegant and intuitive relationships that link atomic structures to the universe as a whole.

This volume focuses on the atomic-nuclear scale relationships detailed in chapters 5 through 12 of Harry Walter Schmitz’s original manuscript. I’ve named this framework “Quantum Wavespace Theory” to emphasize its focus on resonant wave interactions that occur specifically at the atomic and nuclear scales, and the critical relationship to the universe’s dynamic wave structure, or “wavespace”.

QWST proposes that all quantum phenomena emerge from resonant patterns within a universal wavespace, a dynamic continuum distinct from classical ether. All matter naturally forms stable wave patterns that resonate at a fundamental frequency  $f_0$  where:

$$f_0 = \frac{C}{4r_0} = 1.134 \times 10^{23} \text{ Hz}$$

This extremely high frequency is related to the “limiting acoustic velocity” - the speed of light  $C$ , with a wavelength of  $4r_0$  where  $r_0$  is the radius of a proton. Finally, wavespace is limited by the maximum energy density  $M_E$  and pressure  $P_0$  related by:

$$P_0 = M_E C^2$$

The physical nature of our universe is defined in QWST by three fundamental laws:

1. Maximum Velocity	$C$	The limiting wave velocity, the speed of light $C$
2. Maximum Pressure	$P_0$	The limiting pressure $P_0$ also related to the maximum energy density $M_E$
3. Law of Resonance	$4r_0$	All stable matter must resonate with the fundamental wavelength $4r_0$

From these simple concepts, along with basic tools of math and physics (calculus, geometry, conservation of energy, and wave physics) we can derive the fundamental constants that underlie quantum mechanics.

Crucially, QWST is neither a revival of classical ether theory nor merely a reinterpretation of vacuum energy. Instead, it posits a continuous wave medium underlying atomic, nuclear, and cosmic phenomenon. Instead of concepts such as wavefunction collapse and observer-dependent quantum reality, it is based on the formation of stable, self-sustaining wave structures emerging naturally from resonance conditions within the quantum wavespace.

### Derivations of Physical Constants

A key achievement of Quantum Wavespace Theory (QWST) is its ability to derive fundamental physical constants directly from simple, wave-based principles. While standard physics treats these constants as empirically measured values without deeper physical explanations, QWST suggests these constants emerge naturally from universal resonance conditions, wave geometry, and boundary interactions. Highlights include:

- Rydberg Constant  $R_\infty$ : Appears as a function of the fundamental wave threshold in nucleons and the reaction pattern of electrons, reframing atomic spectral lines as wave resonance effects.
- Planck's Constant  $\hbar$ : Emerges naturally from nucleon energy storage, arising directly from the boundary conditions imposed by universal wavespace resonance.
- Fine-Structure Constant  $\alpha$ : Derived from fundamental wave geometry and energy reflection ratios, revealing intrinsic relationships among electron energy, nucleon energy, and electromagnetic interactions.

- Gravitational Constant  $G$ : Interpreted as a large-scale manifestation of wave imbalance originating from the universe's boundary condition, tying cosmic phenomena to subatomic wave-energy interactions.
- Nucleon Stabilization Ratio  $g_{\Sigma}$ : A newly introduced dimensionless constant representing the minimum stored wave energy within nucleon structures necessary before external forces can impart momentum. This bridges quantum wave phenomena with classical concepts of mass and inertia, and provides insight into the strong nuclear force.

The following table lists fundamental constants of physics, and the corresponding equations derived in terms of  $C, P_0$  and  $r_0$ . It is highly improbable that these derivations—discovered by Harry Walter Schmitz using innovative approaches to solve complex wave equations with only a slide rule—could have been achieved without a firmly grounded conceptual framework.

Importantly, QWST does not contradict quantum mechanics—these equations could be substituted directly into established formulas, yielding identical results. However, their clear connection to first principles offers the potential for new insights into quantum physics.

The mathematical foundation presented in this volume, developed in the 1970s, is grounded in rigorous derivations of wave equations, boundary conditions, and resonance stability. Although it predates modern computational techniques—such as AI-aided simulations or large-scale numerical PDE solvers—it offers an analytically robust framework ripe for contemporary expansion and validation.

Notes on the following Table of Equations: (1) The equations are shown here in terms of  $C, r_0, P_0$  to emphasize fundamental relationships revealed in QWST. (2) Several equations incorporate the dimensionless constants  $A$  and  $D$ , which emerge from wave geometry and calculus as placeholders, greatly simplifying complex wave integrals. (3) The nucleon stabilization ratio  $g_{\Sigma}$ —described in the original manuscript as the field energy storage ratio  $g$ —is a dimensionless constant introduced to represent the equilibrium reaction for nucleon stability and momentum transfer; the symbol  $g_{\Sigma}$  is used to avoid conflict with current applications of the symbol  $g$ . (4) The original manuscript employs CGS electrostatic units, simplifying electromagnetic equations by setting key constants—such as Coulomb's—to unity. Converting these equations to SI units requires careful reintroduction of these constants, including the factor  $k_e = 1/(4\pi\epsilon_0) = C^2 \times 10^{-7}$ . Although these conversions are deeply embedded within the theory's fundamental equations, they have been rigorously verified numerically so that we may present the equations using standard SI units.

## Physical Constants and Corresponding QWST Derivations

Physical Constant	QWST Equation	Derived From:
Basic Frequency of Quantum Wavespace	$f_0 = C/4r_0$	$C, r_0$
Maximum Pressure, Energy Density	$M_E = P_0/C^2$	$C, P_0$
Nucleon Energy	$E_N = 3AP_0r_0^3/2$	$r_0, P_0$
Nucleon Stabilization Ratio "g"	$g_\Sigma = (96 + 2)(6 - 1)(2) = 980$	(wave geometry)
Fine Structure Constant	$\alpha^{-1} = 4AD(98 + 1/\sqrt{3})/\pi$	(wave geometry)
Planck's Constant	$h = 2AP_0r_0^4/C$	$C, r_0, P_0$
Rydberg Constant	$R_\infty = \frac{1}{r_0 144 g_\Sigma^2}$	$r_0, g_\Sigma$
Bohr's Radius	$a_0 = \left(\frac{P_0}{e}\right) \left(\frac{Ar_0^2}{2\pi}\right)^2$	$r_0, P_0$
Nucleon Mass	$m_n = AP_0r_0^3/C^2$	$r_0, P_0$
Electron Charge	$e^2 = \frac{AP_0r_0^4}{\pi\alpha^{-1}(C^2 \cdot 10^{-7})}$	$r_0, P_0, \alpha$
Electron Ionization Energy ( $\approx 13.6 \text{ eV}$ )	$E_I = \frac{AP_0r_0^3}{72g_\Sigma^2}$	$r_0, g_\Sigma, P_0$
Electron Mass	$m_e = \left(\frac{AP_0r_0^3}{C^2}\right) \left(\frac{\alpha^{-1}}{6g_\Sigma}\right)^2$	$C, P_0, r_0, g_\Sigma, \alpha^{-1}$
Dimensionless placeholder constant	$A = \frac{16(\pi^2 - 8)}{3\pi^2}$	(wave geometry)
Dimensionless placeholder constant	$D = \frac{\pi^2}{8(\pi - 2)}$	(wave geometry)

## Finding a Solution to the Quantum Mechanics Puzzle

Intuitive answers to these questions emerge naturally from Quantum Wavespace Theory:

Quantum Mechanics Question	Quantum Wavespace Theory Explanation
1. Why does measurement seemingly cause wavefunctions to collapse?	Measurement introduces new boundary conditions in wavespace. Patterns that do not match fundamental resonance frequencies instantly dissipate or destructively interfere, leaving only stable, resonant wave patterns.
2. What is the physical basis for quantization of energy levels in atoms?	Energy quantization occurs because only wave patterns that resonate with the fundamental frequency of wavespace can form stable structures.
3. What explains the wavefunction and its probability interpretation?	Wavefunctions represent physical waves resonating within wavespace, producing interference patterns that match quantum probability distributions.
4. Why do fundamental physical constants have their specific measured values?	The fundamental physical constants emerge from three constraints: the speed of light, the maximum energy density, and the resonance condition of wavespace.
5. How does wave-particle duality arise?	Particles are stable wave structures resonating within wavespace. Their mass and inertia naturally arise as these wave patterns stabilize, satisfying the law of conservation of energy by balancing external energy sources.
6. What explains quantum entanglement and instantaneous correlations at distance?	When two particles originate under identical resonance conditions, their wave patterns maintain a shared resonance throughout wavespace. As a result, they exhibit instantaneous correlations upon measurement.
7. What is the physical explanation for the uncertainty principle?	Waves inherently lack precise positions or momenta; measuring one property introduces new boundary conditions, altering the wave pattern.
8. How is quantum superposition explained?	Multiple stable wave patterns overlap naturally. Interaction or measurement forces boundary conditions, reducing possibilities to one stable state—like observing Schrödinger's cat as a swarm of bees that settles instantly.

## Reference Frames and the "Ether" Question

While Quantum Wavespace Theory resolves enduring quantum puzzles, it naturally raises another question reminiscent of earlier scientific debates: does it imply an "ether," or an absolute reference frame?

Historically, ether-based theories conflicted with experiments like Michelson–Morley, which found no evidence of absolute ether motion. QWST redefines this concept completely: wavespace itself is the dynamic continuum containing all observers, instruments, and phenomena, making any external 'ether drift' undetectable.

QWST Question	Quantum Wavespace Theory Explanation
9. Does Quantum Wavespace Theory imply an absolute reference frame or ether?	No. Wavespace itself is dynamic and encompasses all observers, measurement tools, and phenomena. In the absence of an external reference, no "ether drift" or absolute motion can be detected.

Thus, Michelson–Morley's null result doesn't contradict QWST—it reinforces it. Observers and instruments share the same universal wave conditions, eliminating any possibility of detecting wavespace as a separate entity. In this way, QWST aligns with Einstein's relativity, sidestepping the ether issue by fully embedding observers within a self-consistent, resonating continuum.

## Why QWST Warrants Further Investigation

- **Unified Wave Paradigm:** By proposing mass, charge, electromagnetism, and gravity as emerging from a single underlying wave structure, QWST offers a cohesive framework that may help unify traditionally separate areas of physics.
- **Deterministic Explanation of Quantization:** Unlike standard quantum mechanics, which treats quantization and wavefunction collapse as probabilistic principles, QWST provides a deterministic, resonance-based explanation.
- **Empirical and Computational Prospects:** Modern tools, such as AI-driven PDE solvers and precision measurement techniques, could rigorously test QWST's predictions regarding fundamental constants and wave resonance conditions. High-precision experimental tests of these constants may reveal subtle dynamics in wavespace, potentially validating or refining its claims.
- **Constructive Debate and Research Stimulus:** QWST encourages novel computational approaches and experimental methods, prompting deeper analysis, constructive critiques, and exploration beyond conventional physics frameworks. Even partial verification or refinement of QWST could significantly advance our understanding of wave-based phenomena in physics.

In the chapters that follow, we examine H. W. Schmitz's Quantum Wavespace Theory in detail, providing evidence that quantum mechanics can be described by a coherent, physical wave model. This framework may offer critical insights, particularly for fusion research, by clarifying nucleon interactions and energy stability at the atomic-nuclear scale.

With modern computational tools and precise experiments, today's researchers can rigorously test these principles, potentially leading to breakthroughs in fusion energy and a deeper, unified understanding of physics.