MAXWELL'S EQUATIONS REVISITED: WHAT THEY ACTUALLY SAY

This section re-examines Maxwell's equations through the framework lens, tracing the Faraday → Maxwell → Tesla lineage and questioning the "photon" interpretation that was added later.

The Four Maxwell Equations in Plain English

1. Gauss's Law for Electricity ($\nabla \cdot \mathbf{E} = \varrho/\varepsilon_0$)

"Electric field lines diverge from (or converge to) charges"

Electric charges are SOURCES of electric field - like water flowing from a fountain.

No mention of: light, photons, speed, travel, vacuum

2. Gauss's Law for Magnetism ($\nabla \cdot \mathbf{B} = 0$)

"Magnetic field lines never start or end - they form closed loops"

There are no magnetic "charges" (monopoles). Magnetic field lines always loop back on themselves.

No mention of: light, photons, speed, travel, vacuum

3. Faraday's Law ($\nabla \times \mathbf{E} = -\partial \mathbf{B}/\partial t$)

"A changing magnetic field produces an electric field"
If a magnetic field CHANGES, it creates an electric field that curls around it. This is the principle behind electric generators: spin a magnet near a wire → changing B field → E field → current.

No mention of: light, photons, speed, travel, vacuum

4. Ampère-Maxwell Law ($\nabla \times \mathbf{B} = \mu_0 \mathbf{J} + \mu_0 \varepsilon_0 \, \partial \mathbf{E}/\partial t$)

"Electric currents AND changing electric fields produce magnetic fields"
Current in a wire creates a magnetic field around it. A changing electric field ALSO creates a magnetic field. This is the principle behind electromagnets.

No mention of: light, photons, speed, travel, vacuum

What Maxwell's Equations Actually Describe

The core message of these equations:

Electric and magnetic fields are COUPLED:

Changing E → creates B

Changing B → creates E

They can sustain each other in a self-propagating oscillation.

When you combine equations 3 and 4 mathematically, you get:

$\nabla^2 \mathbf{E} = \mu_0 \varepsilon_0 \, \partial^2 \mathbf{E}/\partial t^2$

This is the **WAVE EQUATION**.
It describes oscillation propagating through the field. NOT particles travelling through space. WAVES in the electromagnetic field itself.

Where Does "c" Come From?

The constants in Maxwell's equations:

Constant	Name	Value
ε_0	Permittivity of free space	8.854×10^{-12} F/m
μ_0	Permeability of free space	$4\pi \times 10^{-7}$ H/m

These are properties of the MEDIUM (the field itself).

When you derive the wave equation, the wave speed emerges as:

$v = 1/\sqrt{(\mu_0\varepsilon_0)}$

Calculating:

$v = 1/\sqrt{(8.854\times10^{-12} \times 4\pi\times10^{-7})}$ v =

$1/\sqrt{(1.112 \times 10^{-17})}$ $v = 2.998 \times 10^8$ m/s

This is "c"!

But notice what this means:

c is DERIVED from ε_0 and μ_0

These are properties of the FIELD/MEDIUM c is the WAVE
PROPAGATION SPEED through that medium
NOT the speed of "photons travelling through vacuum"
NOT a universal constant imposed from outside

It's a PROPERTY OF THE FIELD ITSELF

The Interpretation Flip

Maxwell's Original Interpretation:

EM waves propagate through a MEDIUM (he called it "luminiferous aether") c is

the wave speed in that medium

Light is an electromagnetic WAVE phenomenon The

field is the fundamental reality

What the equations describe:

Field oscillations

Wave propagation

Coupled E and B dynamics

NO particles, NO photons, NO "travel through vacuum"

Post-Einstein Interpretation:

After Michelson-Morley (1887) "failed" to detect aether:

Aether was abandoned

Light became "photons" (particles) c

became "speed of photons in vacuum"
"Vacuum" became "empty space with properties"

But wait...

"Vacuum" Has Properties?

Modern physics attributes to "vacuum":

Permittivity (ε_0)

Permeability (μ_0)

Impedance ($Z_0 = \sqrt{(\mu_0/\varepsilon_0)} = 377\ \Omega$)

Energy (zero-point fluctuations) Virtual

particles

If "vacuum" has all these properties... **IT'S NOT EMPTY. IT'S A MEDIUM.**

They removed the aether and replaced it with a vacuum that has all the properties of a medium. The aether was smuggled back in under a different name.

Photons Were Added Later

The equations themselves contain no photons. The particle interpretation came from:

Planck (1900): Energy quantisation $E = h\nu$

Einstein (1905): Photoelectric effect explained via light quanta

But this was about **ENERGY QUANTISATION -** not necessarily about particles TRAVELLING.

What if:

Energy is quantised in the FIELD

But the field itself is continuous

"Photons" are field excitation quanta (units of energy exchange)

NOT little bullets flying through space

The equations describe waves. Quantisation describes energy packets. These don't require particles travelling through vacuum.

The Tesla Connection: Faraday → Maxwell → Tesla

Faraday: Discovered electromagnetic induction

Changing magnetic field → electric current Fields

are real and fundamental

Maxwell: Mathematised Faraday's insights

E and B fields are coupled

Self-propagating waves are possible

Wave speed = c (derived from field properties)

Tesla: Applied this understanding to engineering

AC (alternating current) - oscillating fields

Wireless transmission - field resonance

The universe as a vast electromagnetic system

Tesla's Vision:

Tesla didn't think in terms of particles. He thought in terms of FIELDS and RESONANCE.

His inventions worked because:

Fields oscillate

Oscillations can be transmitted

Resonance allows energy transfer

No particles need "travel"

Tesla Technology	Operating Principle
AC motor	Rotating FIELD (not rotating particles)
Wireless transmission	FIELD resonance (not particle beaming)
Tesla coil	FIELD oscillation amplification

Tesla's universe is an electromagnetic FIELD with patterns, resonances, and oscillations. This is EXACTLY what Maxwell's equations describe.

The Framework Reinterpretation of "c"

The Standard Claim:

c = speed of light = speed of photons travelling through vacuum c isa universal constant Light "travels" from source to destination at c

The Framework Position:

c is NOT the "speed of light" in the sense of photons travelling.

The coupling between resonance nodes (Sun-Earth, laser-receiver, etc.) may be **INSTANTANEOUS** - they are patterns within the same unified field, already connected.

What we measure as "c" is the **propagation rate of the DISTURBANCE** that follows the coupling.

Analogy: When you flip a light switch:

The light turns ON essentially instantly (the coupling)

But the electromagnetic disturbance/ripple propagates through the field at c

What Fizeau and Michelson Actually Measured:

Not "light travelling from A to B" but:

The propagation rate of EM disturbance through the local field

Under terrestrial conditions

At Earth's field density In

Earth's atmosphere

They measured how fast the RIPPLE moves, not how fast the CONNECTION is established.

Implications If c Is Disturbance Speed, Not Light Speed

1. Light (Coupling) May Be Instantaneous

Resonance nodes couple directly through the field

No "travel time" for the connection itself

What we measure is the subsequent disturbance

2. c Is Field-Dependent

If $c = 1/\sqrt{(\mu_0 \varepsilon_0)}$ and these are field properties

Then c depends on local field conditions c

measured on Earth may not apply elsewhere

3. Wave-Particle Duality Dissolves

Light is fundamentally WAVE (field oscillation)

"Particle" behaviour = quantised energy exchange with matter No actual particles travelling required

4. "8 Minutes From Sun" Reinterpreted

Sun-Earth coupling may be instantaneous

The "8 minutes" (if real) would be disturbance propagation time Or it may be a calculation based on circular assumptions

5. The Vacuum Is the Field

"Empty space" with properties = the field itself ε_0 and μ_0 are field characteristics c emerges from field structure

Summary: What Maxwell's Equations Tell Us

What They SAY:

- ✓ Electric and magnetic fields exist and are coupled
- ✓ Changing E creates B, changing B creates E
- ✓ This coupling allows self-propagating waves
- ✓ Wave speed is determined by medium properties (ε_0, μ_0)
- ✓ Calculated wave speed ≈ 3×10^8 m/s

What They DON'T Say:

- ✗ Photons exist as particles
- ✗ Light "travels" through empty space
- ✗ c is a universal constant independent of medium
- ✗ The vacuum is truly empty

The Framework Conclusion:

Maxwell's equations are wave equations describing electromagnetic field oscillations propagating at a speed determined by field properties. Nowhere do they mention photons, particles, or travel through vacuum.

$c = 1/\sqrt{(\mu_0\varepsilon_0)}$ is the wave speed in the field medium - or more precisely, the disturbance propagation rate through the field following instantaneous coupling between resonance nodes.

"Photons travelling at c through vacuum" is an interpretation added decades after Maxwell - and one that contradicts the wave nature the equations actually describe.

"Maxwell's equations describe field waves and their propagation. Tesla understood this - he built working technology on fields and resonance, not particles and travel. The equations never mention photons. That was added later.

What we call 'c' may not be the 'speed of light' at all. Light - as coupling between resonance nodes in the unified field - may be instantaneous. What we measure as c is the propagation rate of the electromagnetic DISTURBANCE through the field, not the speed of the connection itself.

Faraday discovered the field. Maxwell described its waves. Tesla engineered with its resonances. Somewhere along the way, we replaced their field-based understanding with particles in vacuum - and lost something important in the translation."