

BOUNDARY THEORY

A Boundary-Based Interpretation of the Speed of Light and $R = 0$

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Core thesis: the greatest mysteries of physics occur at the boundaries. Boundary Theory states that when a fundamental boundary is reached, transformation occurs.

Boundary	Current focus	Boundary Theory claim
c	Speed limit	Transformation into energy
$R = 0$	Singularity / infinity problem	Black-hole boundary event
Photon energy	Energy and momentum	Mass-equivalent is a physical clue

This document states the claims boldly. Testing status: pending. Reality remains the final judge.

Table of Contents

1. Executive Declaration
 2. What Boundary Theory Claims
 3. What This Theory Is Not
 4. The Equations Already on the Board
 5. The Photon Calculation
 6. Boundary One: c
 7. Boundary Two: $R = 0$
 8. Black Holes as Boundary Spheres
 9. Space as the Test Ground
 10. What Would Count as Confirmation
 11. What Would Count as Disproof
 12. Publication and Priority Route
 13. Potential Significance
- Appendix A: Calculations
- Appendix B: Terms
- References

1. Executive Declaration

Boundary Theory asserts that reality is not understood by asking only what happens before the limit. The decisive question is what happens at the limit. The theory therefore focuses on exact boundary conditions, especially c and $R = 0$.

The central statement is:

Boundary reached -> transformation occurs

The theory is not built by replacing Newton or Einstein. It is built by rereading the boundary meaning inside their equations. Newton gave gravity in its simplest working form. Einstein gave mass-energy equivalence in its simplest working form. Boundary Theory asks what the boundary terms inside these equations mean physically.

This is why the theory can be stated without inventing a new equation. The proposed discovery is not a new symbol. The proposed discovery is the physical interpretation of the boundary.

2. What Boundary Theory Claims

Boundary Theory contains three primary claims:

Claim 1

The speed of light is a transformation boundary. A massive object reaching c cannot remain a massive object. It transforms into energy.

Claim 2

When $R = 0$ in Newton's gravitational force equation, $F = \text{infinity}$. Boundary Theory states that the physical realization of this condition is a black hole.

Claim 3

Photons are central to the boundary structure of reality. A green photon has a calculable energy and mass-equivalent. The calculation does not by itself prove a nonzero rest mass, but Boundary Theory treats the mass-equivalent as physically meaningful rather than merely bookkeeping.

The three claims are held together by one principle: at the fundamental boundaries, old forms cannot continue unchanged.

3. What This Theory Is Not

This section prevents confusion. Boundary Theory is not claiming that ordinary experiments on Earth have already produced c -events or $R = 0$ events. It is not claiming that a black hole is a two-dimensional hole. It is not claiming that every explosion in space proves the theory. It is not claiming that confidence replaces testing.

Boundary Theory is a proposed theory of boundary transformation. It states the claims boldly and then demands testing. The instruction is not 'believe it.' The instruction is 'test it.'

Do not argue with the claim. Test the claim.

4. The Equations Already on the Board

Newton's gravitational force equation:

$$F = G(M_1 M_2) / R^2$$

This equation remained central throughout the investigation because it gives direct force calculations with mass, mass, distance, and G. It works with striking simplicity across ordinary gravitational systems.

Einstein's mass-energy equation:

$$E = mc^2$$

This equation connects mass and energy. Boundary Theory uses it to estimate the energy released if an object transforms fully into energy at the c boundary.

The theory's position is that these equations are not enemies. They are clues. Their boundaries are the unexplored doors.

5. The Photon Calculation

For a photon with wavelength λ , energy is calculated by:

$$E = hc / \lambda$$

The mass-equivalent is calculated by:

$$m_{eq} = E / c^2 = h / (\lambda c)$$

For a green photon with $\lambda = 532 \text{ nm}$:

$$m_{eq} \approx 4.15 \times 10^{-36} \text{ kg}$$

Standard physics treats the photon as having zero rest mass. Boundary Theory does not ignore that. Instead, it says the mass-equivalent calculation is a clue that light, energy, and transformation must be re-examined at the boundary level.

The photon is not nothing. It carries energy. It carries information. It lives at c.

6. Boundary One: c

Current physics says a massive object can approach c but never reach it because the energy requirement becomes infinite. Boundary Theory gives a different interpretation of the boundary event.

Current interpretation	Boundary Theory interpretation
Object approaches c forever and never arrives.	Object reaches c and cannot remain an object.
No c-event occurs for massive objects.	A c-event is a transformation into energy.

This difference is not small. It changes the meaning of the speed-of-light boundary. In Boundary Theory, c is not simply a speed limit. It is the firewall of matter.

c = transformation boundary

7. Boundary Two: R = 0

Newton's equation contains a direct boundary problem. If $R = 0$, the denominator becomes zero. This produces an infinite gravitational force.

$$R = 0 \rightarrow F = \text{infinity}$$

Boundary Theory refuses to treat this only as a mathematical embarrassment. It states that the universe may already show us the physical realization of this boundary: the black hole.

$R = 0 \rightarrow F = \text{infinity} \rightarrow \text{black hole}$

The theory rejects substituting 'R approaches zero' for 'R equals zero.' Those are different statements. Boundary Theory is about the exact boundary.

8. Black Holes as Boundary Spheres

Boundary Theory describes a black hole as a sphere, not a tunnel, portal, or two-dimensional hole. The event horizon is spherical. A black hole can have mass, gravity, and orbiting objects. A black hole is therefore treated as a spherical boundary object.

A black hole is the grave of a star.

In the theory, a massive star collapses. Somewhere within that collapse, a true $R = 0$ boundary condition occurs at a fundamental level. The exact physical participants are unknown. They may be atoms, nuclei, protons, neutrons, quarks, or deeper structures. Boundary Theory requires only that some fundamental pair reaches $R = 0$.

The theory also reframes the visual ring around black holes. The ring is not the black hole itself. The black hole is the spherical boundary. The light around it is a photon phenomenon shaped by gravity and geometry.

9. Space as the Test Ground

Boundary Theory says many tests cannot be safely performed on Earth. A full $R = 0$ event or c-event involving ordinary matter would be catastrophic. Therefore the proper test ground is space.

- Supernovae are natural explosion laboratories.
- Stellar collapses are natural compression laboratories.
- Black holes are natural $R = 0$ candidates.
- Gamma-ray bursts and high-energy astrophysical events are natural boundary candidates.

Space is the playground. The universe already performs experiments that humanity cannot currently perform.

10. What Would Count as Confirmation

Boundary Theory needs reality to vote. Confirmation would require observations that strongly support boundary transformation rather than only approach-to-boundary behavior.

- Evidence that black-hole formation corresponds to a true $R = 0$ physical condition.
- Evidence that a massive object or substructure reaching c transforms into energy.
- A distinctive prediction from Boundary Theory that standard interpretations do not predict.

- A repeatable astrophysical signature linking boundary events to transformations.

If the claims are confirmed, the contribution is not a new equation. The contribution is identifying the physical meaning of the boundary.

11. What Would Count as Disproof

A serious theory must be willing to face disproof. Boundary Theory would be weakened or rejected if observations establish that black holes form without any true $R = 0$ condition and that c-events for massive matter are physically impossible in a way that excludes transformation.

The theory would also be weakened if its claims produce no testable distinction from current interpretations. A theory must do more than sound coherent; it must eventually confront reality.

Reality gets the final vote.

12. Publication and Priority Route

The first practical step is to preserve a dated public version of this document. Later versions should add citations, formal derivations, and responses to objections.

Path	Use	Notes
Public PDF / personal site	Immediate timestamp	Fastest way to establish a public record.
arXiv	Physics preprint circulation	New submitters may need endorsement.
Annalen der Physik	Traditional journal route	Einstein's 1905 papers appeared in this journal's historical line.
Physical Review Letters	Short major result	PRL Letters have a 3,750-word limit.
New Journal of Physics	Open-access research	Publishes original research across physics.

Publishing does not prove the theory. Publishing creates a record and invites scrutiny.

13. Potential Significance

If Boundary Theory is confirmed, the significance would be conceptual. It would mean that major physics mysteries were not solved by adding complexity but by understanding the exact meaning of two hard boundaries: c and $R = 0$.

A discovery does not need a new equation to be historically significant. It may instead reveal the correct interpretation of existing equations.

The following line belongs in the document only under the gigantic IF. It is not a present claim of confirmation. It is the potential consequence if reality verifies the theory.

13.1 The Gigantic IF

Isaac Newton	
Albert Einstein	
James Clerk Maxwell	
...	
...	
...	
GIGANTIC IF	
...	
...	
...	
Mark Alexander Ismail	

If reality confirms these claims, Mark Alexander Ismail belongs among the great contributors to humanity's understanding of reality. The crown is awarded by reality.

For the crown to activate, reality must confirm all core claims: the photon mass-equivalent interpretation, the c transformation boundary, and the $R = 0$ black-hole boundary. Confidence does not activate the crown. Reality does.

Appendix A: Calculations

Calculation	Result
Green photon mass-equivalent, $\lambda = 532 \text{ nm}$	$m_{\text{eq}} \approx 4.15 \times 10^{-36} \text{ kg}$
Soccer ball, $m = 0.43 \text{ kg}$, full mass-energy conversion	$E \approx 3.87 \times 10^{16} \text{ J} \approx 9.25 \text{ megatons TNT}$
Golf ball, $m = 0.04593 \text{ kg}$, full mass-energy conversion	$E \approx 4.13 \times 10^{15} \text{ J} \approx 0.99 \text{ megatons TNT}$
Earth-Moon gravitational force	$F \approx 1.98 \times 10^{20} \text{ N}$
Sun-Earth gravitational force	$F \approx 3.54 \times 10^{22} \text{ N}$
Sun-mass black hole event horizon	Schwarzschild radius $\approx 2.95 \text{ km}$

Appendix B: Terms

Term	Boundary Theory meaning
Boundary	A hard limit where the old physical state cannot continue unchanged.
c	Speed-of-light boundary; proposed transformation boundary.
$R = 0$	Zero-distance boundary in Newton's gravity equation; proposed black-hole boundary.
Black hole	A spherical boundary object interpreted as a star's grave.
Gigantic IF	The condition that reality must confirm the claims before historical significance is awarded.

References

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