Tab 1

Theory of Nature: Unified Properties of Magnetism, Electricity, and Light

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Introduction

Traditionally, magnetism, electricity, and light have been treated as distinct phenomena governed by separate laws in classical physics. This paper proposes a unified theory in which all three are manifestations of a single energy form: the **Pothu**.

The Pothu is an energy storage and transfer system with mechanical properties common to magnetism, electricity, and light. Its structure comprises five elements and two forces that adapt to external conditions. The structural framework of this theory uses unique terminology derived from the classical Tamil language to categorize the fundamental components and forces of energy.

A key assertion of this theory is that energy transfer occurs instantaneously upon reaching its destination, which challenges conventional models that assume continuous propagation delays. The study explores magnetism, electricity, light, and static electricity, addressing phenomena such as magnetic attraction, field-line formation, and the speed of light.

Abstract

Magnetism, electricity, and light have traditionally been studied as separate phenomena governed by distinct laws in classical physics. While Maxwell's equations provide a partial unification of electromagnetism, no single mechanical framework adequately explains the shared behavioral properties of all three phenomena — including field-line formation, magnetic attraction and repulsion, and the propagation characteristics of light and electricity.

A fundamental question remains unanswered: why do magnetism, electricity, and light exhibit structurally similar behaviors — such as pole-like directionality, energy transfer patterns, and field geometry — if they are governed by entirely separate mechanisms?

This paper proposes a theoretical framework called the "Theory of Nature," in which magnetism, electricity, and light are treated as manifestations of a single structured energy unit termed the **Pothu**. The Pothu consists of five components — a central core (**Maiyam**), two linking elements (**Kai**), and two outer terminals (**Vilumbu**) —

governed by two interacting forces: **Kai force** and **Maiyam force**. The behavior of magnetic poles, electric circuits, and light propagation is analyzed within this unified structural model.

The framework offers mechanistic explanations for magnetic attraction and repulsion, field-line geometry, the concentration of magnetic fields in elongated regions, and the formation of closed electrical circuits. It further proposes that energy transfer in both electricity and light becomes real-time upon reaching its destination — a property termed **Maiyavalaiyam** — supported by a reanalysis of Ole Rømer's 1676 astronomical observations of Jupiter's moon Io.

The Pothu framework presents a structurally unified model for three fundamental physical phenomena. While further experimental validation is required, this theory opens a novel avenue for reconsidering the mechanical basis of electromagnetic behavior and light propagation.

Glossary of Key Terms

Pothu: The fundamental energy form, or stored-energy mechanism, that underlies magnetism, electricity, and light.

Maiyam: The central core of the Pothu.

Kai: The two linking parts per Pothu that maintain the bonded connection between the Maiyam and the Vilumbu.

Vilumbu: The two end parts on either side of the Pothu (specifically, the Ner Vilumbu and the Ethir Vilumbu).

MaiyaKudumbam: Many Pothu connected by Maiyam force, acting together as a family.

Maiyavalaiyam: In electricity — a closed circuit; in light — the light itself after it reaches the action area (the real-time operational phase).

Maiyabimbam: The escaping entity when a Pothu leaves the pole during Maiyavalaiyam.

Maiyapinaipu: The connecting mechanism that determines voltage.

Maiyavadu: Central scar.

Key Questions

- Why do magnets stick?
- Why do magnetic poles repel each other?
- Why is the magnetic field stronger in elongated regions?
- Why do magnetic fields form lines?

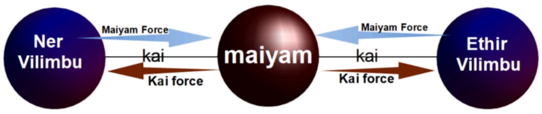
- Why does light take time to reach its destination, but once it arrives, it operates in real time?
- The same applies to electricity.
- Why does the speed of light involve acceleration?

Structure and Dynamics of the Pothu

The Pothu is a structured energy form with five components and two interacting forces.

Five Parts of the Pothu

1. **Maiyam** (central core)
2. Two **Kai** (links between the Maiyam and the Vilumbu)
3. Two **Vilumbu** (**Ner Vilumbu** and **Ethir Vilumbu** at the outer edges)

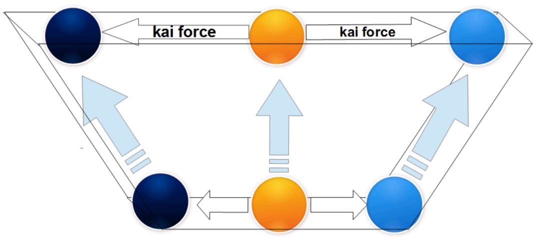


Two Forces

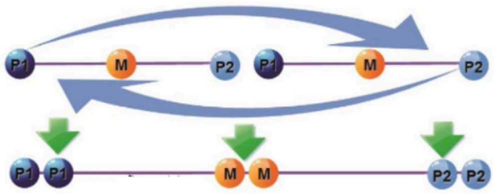
- **Kai force** – pushes the Vilumbu away from the Maiyam.
- **Maiyam force** – (1) unites all Pothu into a MaiyaKudumbam, and (2) keeps all five parts of each Pothu in contact with the Maiyam.

Functions of the Pothu

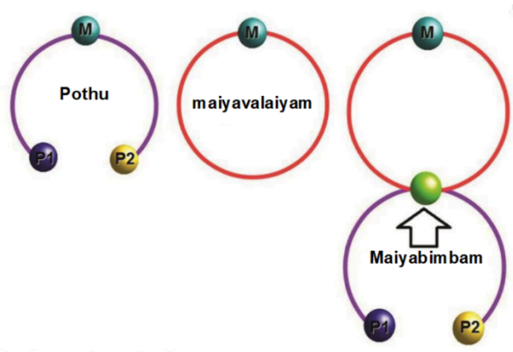
4. **Kai forces** are stronger than the **Maiyam force**.
5. A magnetic pole cannot reach the **Maiyam** through its own **Kai**. Wherever the Kai force cannot act, the Maiyam force prevails.
6. The **Pothu** always selects the widest available space through the pushing power of the **Kai force**.



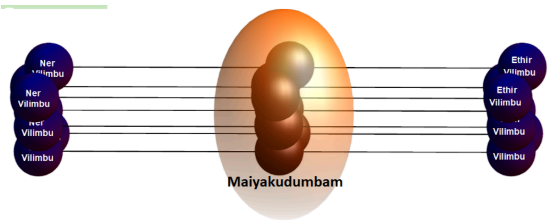
7. A Pothu or **Maiyabimbam** naturally gravitates toward **Maiyapinaipu**.



8. **Maiyavalaiyam** is real-time.



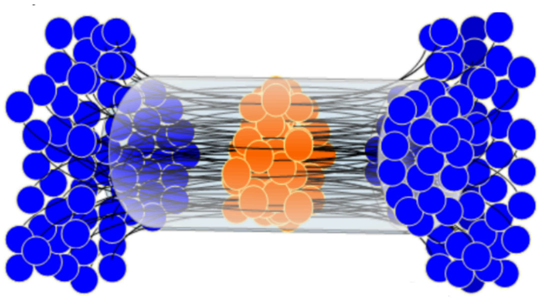
9. **Maiyavalaiyam** defines position. The pole reaches the Maiyam through the opposite Kai of the Pothu. In electricity, Maiyavalaiyam is a closed circuit once ampere is spent. In light, the light itself is always Maiyavalaiyam.
10. The **Pothu** always protects itself. If it has a chance to leave the pole during Maiyavalaiyam, it will do so; this escaping entity is called **Maiyabimbam**. To protect itself from regions of high destruction, the Pothu chooses locations with less destruction.



11. If a Pothu occupies a space, it unites with others as a **MaiyaKudumbam** through the Maiyam force.
12. The Pothu has no mass.

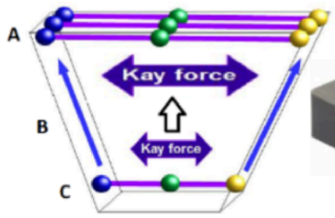
Magnetism

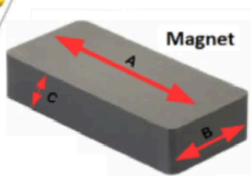
In a magnet, the two Vilumbu of the Pothu are identified as the South Pole and the North Pole. Because of the **Kai forces**, the poles cannot remain inside the magnet. Because of the **Maiyam forces**, the poles cannot move away from the magnet. Consequently, the magnetic poles concentrate outside the magnet.

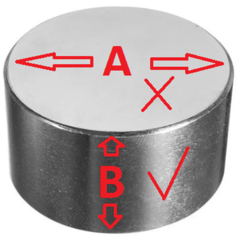


Due to the combined action of **Kai force** and **Maiyam force**, the poles bulge outward, and the remaining Kai force penetrates its own pole, creating a path for travel. No matter how strong the Kai force is, it cannot move away from the center without an existing pole, because the pole is the outermost Vilumbu and the Kai can only penetrate through an existing pole.

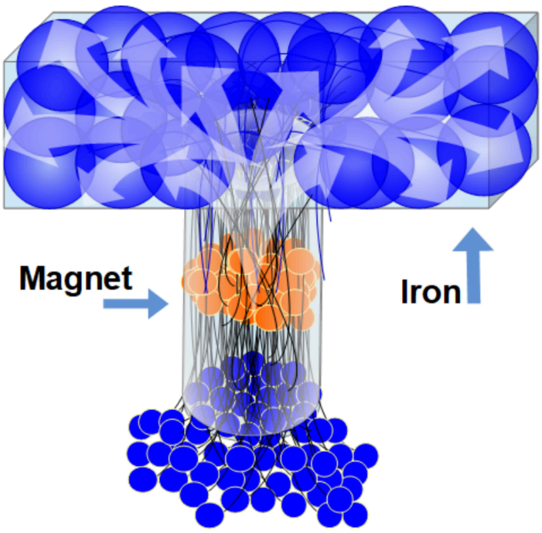
The Pothu of the magnet selects the longest available location through the Kai force. Subsequent locations are chosen according to density. This selection process makes the magnetic field stronger in elongated regions. If the two poles cannot be properly separated in a given location (for example, in a circle or triangle), that location is skipped.



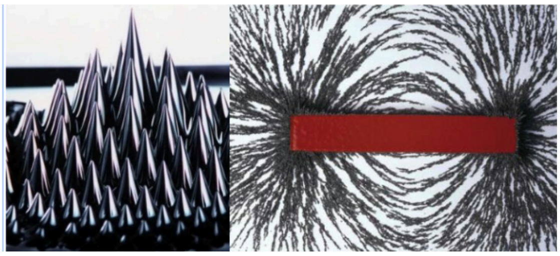




When a permeable material such as iron approaches, the magnetic poles relax their pressure. The poles penetrate the ferromagnetic (“swimmable”) object (iron). The compressed poles then expand and relax, all the while the **Maiyam force** pulls the interpenetrated pole toward the **Maiyam**. This is the cause of magnetic attraction.



The magnetic field of a magnet travels through the interior of the magnet and through the magnetic poles of its **MaiyaKudumbam**. The direction is always away from the center. Because the poles cannot spread inside the magnet, the field pushes the magnetic poles outward and releases pressure outside the magnet. At that point, the force of the field pulls the extended pole, forming the magnetic lines observed when iron powder is sprinkled.



A cylinder magnet has two sides. With respect to the center, those magnetic fields are one **Ner Vilumbu** and the other **Ethir Vilumbu**. From our perspective outside the magnet, both are the same. Apart from whether they are favorable or unfavorable to whatever reference (South Pole or North Pole) you have set, they do not have inherent labels/identities.

Magnetic poles can perceive only three things.

First: By relaxing its pressure, it becomes an attractive object (such as iron). This is **attraction**.

Second: The pole that lies at a 180-degree angle to the pole of another magnet. This is **repulsion**.

This is because when one magnetic pole is at 180 degrees relative to another, they cannot penetrate each other. Therefore, when two poles (North-North or South-South) approach each other, both try to push away from one another.

At this point, the remaining two forces come into play.

We press the edge of the **pothu** towards the **maiyam**, against the **kai** force.

The third force: The poles at 180 degrees try to relieve the pressure by changing their angle. That is why they attempt to rotate.

(Note: In magnetic compass needles, even due to the Earth's magnetic attraction or repulsion, the needle does not fix its angle arbitrarily. Instead, it aligns itself specifically to remain at 0 degrees — i.e., in the North-South direction.)

Magnetic poles cannot identify their opposite poles. Therefore, when **pothu** is present in a magnet, that **pothu** never transforms into **Maiyavalaiyam**.

If two magnets attract each other, the reason for that is that one magnet considers the other not as a magnet but as iron.

If two coil wires (solenoids) attract each other in a place without iron, the reason for that is the **MaiyaKudumbam** structure.

Electricity

In electricity, energy arises from the destruction of the center. Energy transfer is not a flow process like water.

If we connect several batteries in parallel, it will strengthen the **MaiyaKudumbam**. If we connect the same batteries in series, it will strengthen the **Maiyapinaipu**.

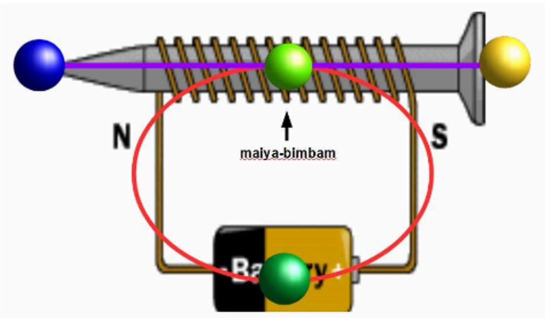
Due to pole expansion of the electric Pothu and the pushing force of the **Kai force**, poles spread wherever electricity can be conducted.

When these spread poles reach their opposite pole, **Maiyavalaiyam** (a closed circuit) is formed.

Magnetism acts as part of the “body” of electricity during Maiyavalaiyam. Any energy loss during the transmission of electricity is not due to distance, but to the creation of a magnetic field. Reducing magnetic-field creation reduces loss. This is why high voltage is used for long-distance transmission: amperage decreases, thereby decreasing magnetic induction.

During electricity consumption, the Maiyavalaiyam perishes and the Pothu reaches a pole where escape is possible. It will definitely escape; this is called **Maiyabimbam**.

In a transformer, wire thickness determines **MaiyaKudumbam** and wire length determines **Maiyapinaipu**.



According to this theory, Maiyavalaiyam is real-time — a property shared by both light and electricity.

Real-Time Energy Transfer in Electricity — An Example

To illustrate this, consider data transfer between two computers over a copper wire. The speed of electricity is said to be slightly less than the speed of light. The cable used in this example is a Copper CAT 6A Cable.

Real-Time Energy Transfer in Electricity — Calculation

Data transfer between two computers over a 100 m Copper CAT 6A Cable:

1. Wave lifetime (one cycle): 1 ÷ 400,000,000 Hz = 2.5 ns. At 400 MHz, each wave cycle lasts 2.5 nanoseconds.

2. Maximum travel distance per cycle (at the speed of light): $299{,}792{,}458 \times 2.5 \times 10^{-9} = 0.749$ m. According to conventional theory, a single wave cycle cannot travel even one meter.

3. Effective half-cycle limit: 2.5 ns ÷ 2 = 1.25 ns. Half of the 2.5 ns represents the opposite charge, meaning voltage must reach the other end of the wire within 1.25 ns.

4. Required speed of electricity (to cross 100 m in 1.25 ns): $100 \text{ m} \div 1.25 \times 10^{-9} \text{ s} = 8 \times 10^{10}$ m/s. At 400 MHz, the implied speed works out to approximately 4×10^{10} m/s — this supports the concept of real-time energy transfer, consistent with the behavior of light.

5. Ratio compared to the current speed-of-light constant (c): $4 \times 10^{10} \div 2.998 \times 10^{8} \approx 132.43$. This is approximately 132.43 times greater than the currently accepted speed-of-light constant (c).

To verify this experimentally: connect an oscilloscope with two channels to the input and output of the cable. If even one wave (or more) is present in the cable at any given moment, the two channels will appear out of sync.

Perhaps, if you deny that electricity does not transfer energy in real time and try to reason why, before you even try to reason, you will admit that electricity does not need a closed circuit to travel. In fact, this is the biggest danger. Electricity certainly does need a closed circuit. If you believe that electricity takes time to travel, you are admitting that electricity certainly does not need a closed circuit.

(**Maiyavadu**: When electricity first travels, it does so at the speed of light; all differences that occurred before reaching the destination are erased at that point. Once it reaches its destination, operation becomes real-time. If the connection is suddenly disconnected, it leaves a residual entity called Maiyavadu. Its lifespan varies depending on the location. If that Maiyavadu is reconnected before its lifetime ends, it does not restart at the speed of light — it reconnects immediately. This is why signals become positive or negative in real time, without restarting from the beginning.)

That wave sequence traveling from this end to that end gets destroyed on the way before 133.43 waves reach there. If the waves that come after that reach the target, then it is not necessary to start from the beginning; **Maiyavadu** helps at that point.

Light

Light is Maiyavalaiyam

According to the Pothu theory, the Pothu always protects itself. If it has a chance to leave the pole during Maiyavalaiyam, it will definitely do so. This escaping entity is called **Maiyabimbam**. The Pothu always protects itself by choosing a location with less destruction. The pole of the light-Pothu travels in all directions because it does not require a medium to travel through.

Ole Christensen Rømer (1644–1710) was a Danish astronomer renowned for being the first to measure the speed of light in 1676. At that time, many scientists believed that light traveled instantaneously. Rømer's research proved that the speed of light is finite.

Ole Rømer's research confirmed four things, though only the first has received widespread recognition. The remaining three have gone largely unnoticed:

1. The speed of light is finite.
2. Light transfers energy in real-time.
3. The speed of light involves acceleration.
4. Light is dependent on its source.

First: The Speed of Light is Finite

Rømer confirmed that the speed of light is finite. The remaining three findings are explored below.

Second: Light Transfers Energy in Real-Time

The 11-minute disappearance of Io proves this.

When Earth is closest to Jupiter, the moon Io is invisible for a total of 3 hours and 10 minutes: 3 hours because it is behind Jupiter, and an additional 10 minutes due to the greater distance the light must travel after it emerges. Similarly, when Earth is farthest from Jupiter, Io is behind Jupiter for 3 hours, and the remaining 21 minutes of invisibility are due to the greater distance. Ole Rømer took the measurement from the farther position, subtracted the measurement from the closer position, and identified the remaining 11 minutes as the time it takes for light to cross the diameter of Earth's orbit.

Suppose we place a flashlight on the moon Io that stays ON for 30 minutes and then OFF for 30 minutes, repeating this cycle continuously.

If we observe this flashlight from Earth, we would see a strange pattern: it appears to stay OFF for 41 minutes, then ON for only 19 minutes, and then OFF for 41 minutes again, repeating in this way.

Using the concept of light-travel delay, how would you explain this distorted timing?

Some might say: ‘Such a distortion in timing would not occur — it would only appear as 30 minutes ON and 30 minutes OFF.’

If that is the case, then Ole Rømer would not have been able to notice any difference at all. Think about it: when no difference occurs, what would he have recorded?

Ole Roemer conducted an experiment and recorded it; now let's explore what possible factors could be involved in this.

When Earth is close to Jupiter, Io appears at a specific time, but when Earth is far from Jupiter, Io is seen 11 minutes later.

Let's consider only when Earth is far from Jupiter

First possibility:

We see Io before it hides behind Jupiter, then we see Jupiter without Io when it's hidden, then we see Io reappear near Jupiter. We observed it 11 minutes later than the expected time. Since the light coming from Jupiter is already coming delayed, why should it be delayed an additional 11 minutes? This indicates that it's coming even later than the delay. Based on this, Ole Roemer must have lied about his experiment.

Second possibility:

Ole Roemer says he saw Io 11 minutes later. Perhaps when Earth is far away, Io remains hidden behind Jupiter for an additional 11 minutes. If so, the delay would increase by 11 minutes in each orbit. However, given approximately 1.769 days, this possibility seems impossible.

Third possibility:

We are observing Io and Jupiter in real-time before Io hides. After Io hides, we see Jupiter without Io. When Io reappears, we still see Jupiter. However, Io's light doesn't arrive, but Io continues its journey without stopping. But when the light arrives, we see Io at the position it is at that time.

If Ole Roemer's experiment is true, it confirms that even though light takes time to travel, we see real-time events.

When Earth is close to Jupiter, Ole Rømer recorded that the reappearance of the hidden Io took 3 hours and 10 minutes.

When Earth is very far from Jupiter, he recorded that the reappearance of the hidden Io took 3 hours and 21 minutes.

He identified this 11-minute difference as the time taken for light to cross the diameter of Earth's orbit.

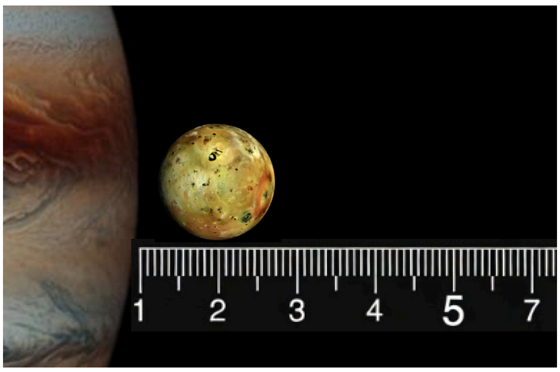
From this observation, only one conclusion follows: we observe the disappearance of Io instantaneously. If the disappearance were observed with a distance-dependent delay, the 3 hour 10 minute period would never have changed.

Furthermore, if light leaving Io takes 11 minutes to reach us, then Io's orbital period would appear to increase by 11 minutes with each orbit — accumulating to 110 extra minutes by the tenth orbit. 44 hours 17 minutes

The moon Io takes approximately 1.769 Earth days (about 42 hours and 27 minutes) to complete one orbit around Jupiter. If the light delay accumulated, by the 10th orbit it would appear to take 44 hours and 17 minutes. Since this does not happen, when the light from Io reaches us, we do not see Io at the position where it was when the light left; instead, we see it at the position where it is right now.

When Io does not change its orbital period despite the delay of light:

- When Earth is close to Jupiter → Io reappears in the 2nd position.
- When Earth is far from Jupiter → Io reappears in the 3rd position.



If you assume that at this place you are looking at Io at the place where it is, the time taken for that scene to reach you is 930 million km/s. That is, approximately 3102. times greater than the speed of light.

Third: The Speed of Light Involves Acceleration

The speed of light is not a fixed constant — it involves acceleration.

When the Earth's orbital diameter is at its larger value, it is 3.04×10^{11} m; at its smaller value, it is 2.94×10^{11} m. The time taken for light to cross the larger diameter is 16.898 minutes, and across the smaller diameter is 16.342 minutes.

Based on the current accepted speed of light, it should take approximately 16 minutes to cross Earth's orbital diameter. Ole Rømer recorded 11 minutes. This means light covered that distance in only 11 minutes, implying it was traveling at approximately 1.45 times the accepted speed of light at that point.

Although this factor of 1.45 applies locally, considering the total distance from Jupiter to Earth, only about one-third of the journey is directly observable: 9.68×10^{8} km ÷ 3.04×10^{8} km ≈ 3.184. This indicates that, due to acceleration occurring before entering Earth's orbit, light would have entered at a speed greater than the currently accepted constant. Precise quantification of this acceleration ratio is beyond the scope of this paper.

Before reaching a target, the Vilumbu are not yet transmitting light. They travel toward the target by the force of the Kai. Before reaching the target, energy is converted to add strength to the Kai force — which is why the speed of light increases as it accelerates.

Fourth: Light is Dependent on Its Source

The second and third points together confirm that light is dependent on its source.

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Second Physics Research Paper

Undetectable Solar System Analogues: Orbital Inclination, Phase-Dependent Visibility and Real-time Energy Transfer

A Continuing Study – Part of the Theory of Nature (Its original document said what light can do, while this one says what light cannot do.)

Abstract

Classical physics has long treated magnetism, electricity, and light as independent phenomena controlled by separate principles. Although Maxwell's equations achieved a partial unification of electricity and magnetism, they do not provide a single mechanical structure capable of explaining the common features observed across all three — such as directional polarity, field-line patterns, attractive and repulsive interactions, and the manner in which energy is transferred.

This raises a basic question: if these phenomena are truly governed by unrelated mechanisms, why do they display such closely related structural and behavioral characteristics?

In response, this paper introduces the Theory of Nature, a framework in which magnetism, electricity, and light are understood as different expressions of one underlying energy unit called the Pothu. The Pothu is composed of five structural elements — a central core (Maiyam), two connecting links (Kai), and two outer terminals (Vilumbu) — regulated by two complementary forces: the Kai force and the Maiyam force. Within this model, the formation of magnetic poles, the closing of electric circuits, and the propagation of light are examined as interrelated processes arising from the same internal architecture.

The theory supplies concrete mechanical accounts for magnetic attraction and repulsion, the tendency of magnetic fields to strengthen in elongated configurations, the appearance of field lines, and the establishment of closed electrical paths. It further argues that, once energy reaches its destination, both electricity and light operate in real time — a condition designated Maiyavalaiyam. This claim is supported by a fresh examination of Ole Rømer's 1676 observations of Jupiter's moon Io.

By presenting magnetism, electricity, and light as manifestations of a single structured energy system, the Pothu framework offers a new perspective on the mechanical foundations of electromagnetic phenomena and light. Although additional experimental testing is still needed, the approach opens a distinct path for rethinking these fundamental interactions.

Keywords: Real-time energy transfer, nature of light, orbital inclination, edge-on/face-on viewing geometry, exoplanet detection methods, Pothu theory, angular selection effects, solar system analogues.

1. Introduction

In classical physics, magnetism, electricity, and light have usually been regarded as separate domains, each governed by its own set of laws. Although Maxwell's equations succeeded in linking electricity and magnetism to a considerable extent, a single mechanical description that simultaneously accounts for the shared structural and dynamic features of all three phenomena has remained elusive.

This paper advances a unified theoretical framework known as the Theory of Nature. According to this approach, magnetism, electricity, and light are not independent entities but different expressions of one underlying energy unit called the Pothu. The Pothu functions as a structured system for storing and transferring energy, possessing mechanical characteristics that appear consistently across magnetic, electrical, and optical processes.

The internal architecture of the Pothu consists of five distinct components and two interacting forces whose relative strengths adjust according to external conditions. To describe these components and forces with precision, the framework employs specialized terms drawn from classical Tamil: Maiyam for the central core, Kai for the linking elements, and Vilumbu for the outer terminals. These terms are retained throughout the analysis because they capture structural relationships that conventional English terminology does not readily express.

A central claim of the theory is that energy transfer, once it reaches its intended location, takes place in real time. This property, designated Maiyavalaiyam, stands in contrast to conventional models that treat propagation as a continuous process subject to distance-dependent delays. The present work examines this principle through detailed consideration of magnetic attraction and repulsion, the formation of field lines, the behavior of electric circuits, and the observational record of the speed of light, particularly Ole Rømer's 1676 measurements involving Jupiter's moon Io.

By treating the three phenomena as manifestations of a single structured energy system, the Theory of Nature seeks to provide a coherent mechanical foundation for their observed similarities and to open a new avenue for interpreting both laboratory and astronomical observations.

2. Exoplanet Detection Methods and Angular Limitations

Although many established methods exist for detecting exoplanets, all except direct imaging are set at a specific angle. At that angle, the light reflected from the planet disappears even before the planet completes a full orbit. This geometrical truth is not merely a technical difficulty; it is a fundamental limitation arising from orbital inclination, illumination geometry, and the observer's viewing angle.

If the light reflected from the planet does not disappear before reaching us, we can see it at its location. If this cycle is shorter than the time taken for the light reflected from the planet to reach us, that light will never reach us.

The primary detection methods are as follows:

1. Transit Method (Transit Photometry)

Detects planets when they pass in front of their star, causing a periodic dip in the star's brightness (light curve). Provides planet radius and orbital period. This is currently the most productive method (e.g., Kepler and TESS missions). However, it requires a nearly edge-on orbital inclination ($i \approx 90°$) for transits to occur and be observable. From other viewing angles, no dip is detected, meaning the planet remains hidden despite its existence.

2. Radial Velocity Method (Doppler Spectroscopy / Wobble Method)

Measures the star's tiny "wobble" caused by the planet's gravity, detected as periodic Doppler shifts (blueshift/redshift) in the star's spectral lines. Provides minimum planet mass and orbital information. Historically the first major successful method. It is most sensitive to edge-on or high-inclination systems; face-on orbits produce no detectable radial velocity signal along the line of sight, rendering planets invisible to this technique regardless of their mass or proximity.

3. Gravitational Microlensing

Uses the gravitational lensing effect when a foreground star+planet system magnifies light from a background star. Shows characteristic deviations in the light curve. Good for detecting distant or free-floating planets. The alignment geometry is highly specific and transient; most systems will never produce a detectable microlensing event from our viewpoint, again due to random orbital orientations and the precise alignment required.

4. Astrometry

Precisely measures tiny shifts in the star's position on the sky due to the planet's gravitational pull (e.g., using Gaia satellite data). While powerful in principle, it is most effective for face-on or intermediate inclinations where the positional wobble is maximal on the plane of the sky. Edge-on systems produce minimal astrometric signals, creating a complementary bias to radial velocity.

These indirect methods (especially Transit + Radial Velocity) are routinely combined for confirmation and full characterization (mass + radius → density, composition). Most confirmed exoplanets (~5,000+) were found without direct images. Yet all of them share a common limitation: they depend on the planet being in a specific orbital phase and inclination relative to the observer for the light signal (or its gravitational effect) to be detectable. When the planet's dark side faces the observer or when the orbital plane is unfavorable, the reflected or modulated light effectively "disappears" for that portion of the orbit — consistent with the real-time energy transfer requirement that continuous, unobstructed illumination and reflection must reach the observer.

5. Direct Imaging

Takes actual photographs of the planet (rare; works best for young, large gas giants in wide orbits using adaptive optics and coronagraphs, e.g., HR 8799 system). This method directly captures light from the planet itself and is far less dependent on precise orbital phase for basic detection, although atmospheric characterization and orbit determination still benefit from favorable geometry. It remains the only method that can, in principle, reveal planets across a wider range of inclinations, though current technology limits it to nearby, bright, young systems.

Consequently, the vast majority of solar system analogues in the Milky Way are likely to be missed by current and near-future surveys precisely because of these strong angular selection effects. Accepting the real-time energy transfer principle elevates the importance of the "dark side" geometry: a planet may be continuously illuminated by its star, yet from our specific viewing angle the reflected energy never reaches us during large portions of its orbit (or ever, for edge-on systems in many techniques). This has profound consequences for exoplanet atmosphere studies, transmission spectroscopy, occurrence rate statistics, and assessments of habitability across the galaxy.

3. Real-time Energy Transfer of Light – Theoretical Background

According to the Pothu framework, light is not merely traveling at finite speed. It is a dynamic process in which energy is transferred in real time from the Maiyam (source/center) to the Vilumbu (reception/end points) through Kai (linking forces).

Jupiter's moon Io disappears from Earth's view for about 11 minutes, depending on its distance from Jupiter and Earth's position.

The sidereal orbital period of Jupiter's moon Io (Io) is approximately 1.769 Earth days (more precisely 1.769137786 days, or about 42 hours, 27 minutes, 33 seconds).

Imagine Jupiter as a star and Io as a planet. If one were to observe this from a distance where light takes 43 hours to travel, even if the satellite called Io is at an angle where it does not disappear behind Jupiter, from the place where we are, if the situation arises where we look at the dark side of Io on which light does not fall, we cannot detect that Jupiter has a satellite by using the light that falls on Io.

This is the evidence for the truth of this article.

This article has been created based on this foundation.

Based on this principle, the distance at which we can reliably observe Mercury in our own solar system is limited. When Mercury's dark side approaches our line of sight, we lose contact with it. For an observer 40 light-days away, Mercury would only be visible for roughly 10 days out of its orbit; observers at 50 light-days might never realize a planet exists near our Sun during certain orbital phases. This demonstrates that even within our own system, geometric and phase-dependent visibility is not complete.

TYC 8998-760-1 b, located approximately 300 light years away, provides a striking example. The light from its parent star reflecting off the planet has been traveling toward Earth for over 300 years without interruption in that particular line of sight. Yet for the vast majority of similar systems, random orbital inclinations mean that such continuous, unobstructed reflection toward our specific location is statistically rare.

4. Broader Implications

- The Milky Way likely contains numerous solar system analogues, yet many will be missed due to random orbital inclinations (edge-on, intermediate, or face-on) combined with the geometric requirements of indirect detection methods.
- Accepting real-time energy transfer elevates the importance of the "dark side" geometry. This has direct consequences for exoplanet atmosphere studies, transmission spectroscopy, and assessments of habitability — planets with atmospheres may exist but remain uncharacterized because we never observe them in transmission or reflection at the right phase.
- Future telescopes and interferometers (James Webb Space Telescope, Extremely Large Telescope, space-based interferometers) should incorporate observational geometry and inclination bias into survey strategies and target selection, prioritizing direct imaging where feasible and statistical debiasing for indirect methods.
- Statistical interpretations of exoplanet occurrence rates must account for these strong angular selection effects. Current estimates likely underrepresent the true

population of solar system analogues, especially those in face-on or intermediate inclinations.

5. Discussion

This work does not reject the finite speed of light or light-travel-time effects established in classical physics. Instead, the Pothu framework introduces an additional dimension: real-time energy transfer. This makes observational geometry (the relative angles between star, planet, and observer) far more critical than previously emphasized in standard exoplanet literature.

By explicitly analyzing the five major detection methods, we see that four of them are fundamentally phase- and inclination-dependent, while only one (direct imaging) offers a more direct window. This reinforces the central claim: many solar system analogues around us may currently be “invisible” not because they do not exist, but because of unfavorable viewing angles and the requirements of real-time energy transfer for continuous observability.

6. Conclusion

Understanding the true nature of light — specifically its capacity for real-time energy transfer — directly determines our ability to observe the universe. The Jupiter/Io example, the Mercury visibility limit, and the stark contrast between face-on and edge-on geometries, now reinforced by the systematic limitations of the five exoplanet detection methods, illustrate this clearly.

Many solar system analogues around us may currently be “invisible” not because they do not exist, but because of unfavorable viewing angles and the phase-dependent nature of reflected light in real-time energy transfer. Re-examining the fundamental properties of light, and integrating geometric selection effects into detection theory, is therefore essential for advancing exoplanet detection and for developing unified physical theories.

This study offers a new perspective for future astronomical observations and for the ongoing development of the Pothu unification framework,