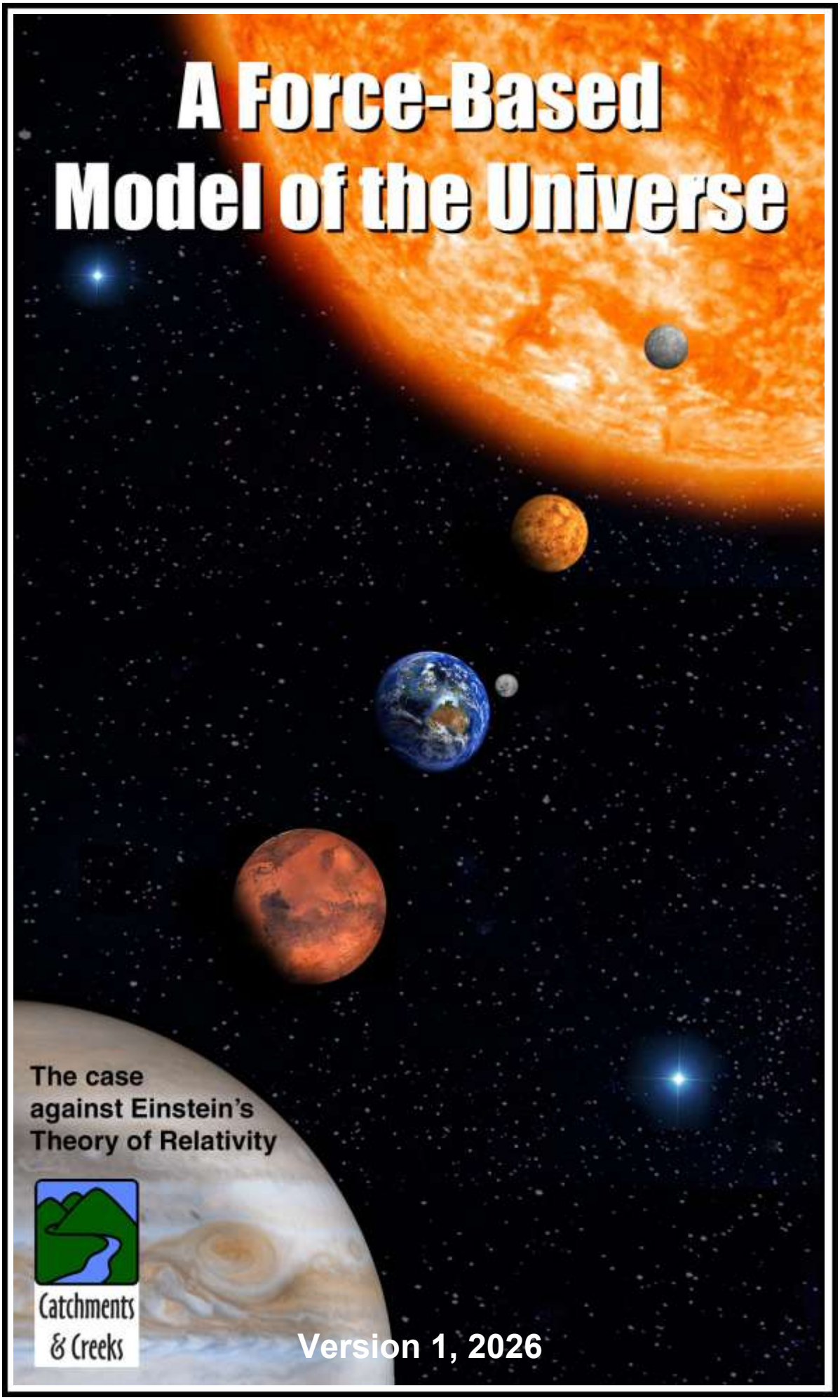
A Force-Based Model of the Universe



The case against Einstein's Theory of Relativity

Catchments & Creeks

Version 1, 2026

A Force-Based Model of the Universe

– The case against Einstein's theory of relativity

Version 1, May 2026

Written and illustrated by: Grant Witheridge, *Catchments and Creeks*, Queensland, Australia.

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Cover image: A photo taken during the return flight from my recent holiday at Jupiter's *'Resort and Day Spa'*, or it could be just a PhotoShop image created by the author.

About the author

Grant is a retired civil engineer with both Bachelor and Masters degrees from the University of New South Wales in Sydney, Australia.

Grant lives with Level 1 autism, which causes him to always look for a logical explanation of his surroundings. Along with his interest in 'art' and 'motor racing', Grant has written books on the topics of aerodynamics, naval architecture, astrophysics, fluid mechanics, fish passage, creek engineering, stormwater management, culvert design, soil erosion, farming practices, gully erosion, and motor racing. The common thread linking most of his publications is 'fluid mechanics'.

Background

As a lecturer in coastal engineering (Griffith Uni) in the mid 1990s, I struggled with the idea that I was teaching my students that ocean tides were caused by the gravitational 'pull' of the Moon. This idea suggests that the Moon's gravity is actually 'pulling' on water particles within our oceans. I knew this explanation wasn't logical, if not outright silly, but I had no other explanation that I could give my students at the time (to all my ex-students; I am so sorry).

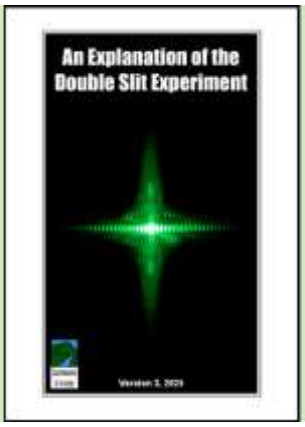
That mental conflict began my quest to look for a more logical explanation of gravity and ocean tides. I am not an astrophysicist. I am a retired civil engineer that one day stumbled into a dark room, and then spent the next 30 years searching for a light switch. My retirement in 2019 gave me more time to dedicate myself to the mental gymnastics that is astrophysics.

My 'light bulb moment' came when I realised that every action, and every event, that has ever occurred within our universe, has occurred because of the actions of forces. Our current theory of the universe is based on the idea that every action requires 'energy' and 'time', which is true. However, if we move from an energy-based model, to a force-based model of the universe, then nothing changes in regarding to the actual physics; but, the physics does become easier to understand. The physics also becomes easier to 'imagine'. After-all, physics is a study of forces, so why not think about the universe in terms of forces, rather than energy.

You can call what fills 'space'; aether, energy, or even miniature boxing kangaroos, it doesn't matter what you call it, the physics remains the same. I have chosen to call it quantum forces. What we call this substance doesn't change what happens, but it can change how we think about its actions. For me; it is easier to think about the actions of forces. If you wish, you could replace my term 'quantum force' with the original term 'aether', and the text would stand unchanged.

I have not changed what exists in that dark room that I entered 30 years ago, I have simply found an alternative source of light through which to visualise the physics of our universe.

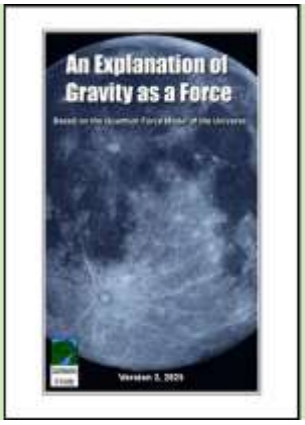
Past papers



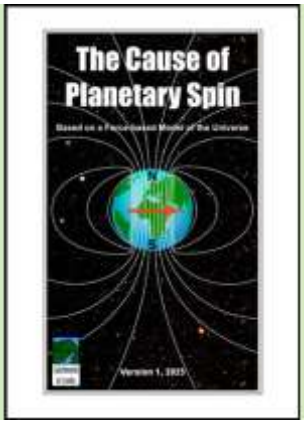
Explanation of the Double Slit V3, 2025

Warning:

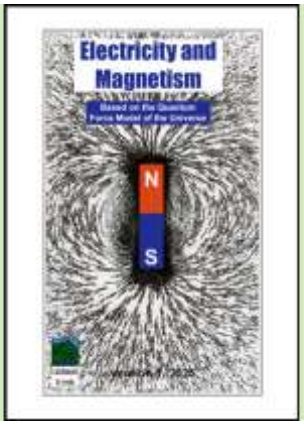
- This paper supersedes the information presented within my past papers (shown here).
- These past papers represent my journey to find a common link between the four known interactions: gravity, magnetism, strong & weak atomic.
- Each paper was an advance on the previous paper; however, each of these past papers now contain statements and talking points that I can no longer support.



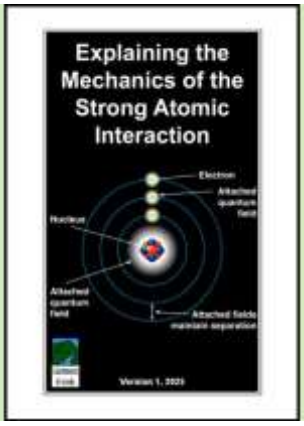
Explanation of Gravity as a Force V2, 2025



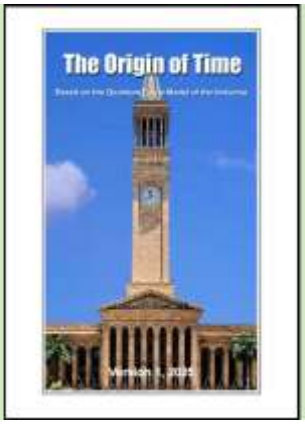
The Cause of Planetary Spin, 2025



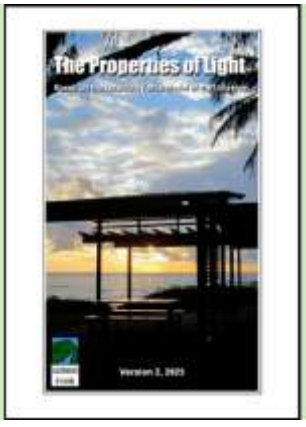
Electricity and Magnetism, 2025



The Strong Atomic Interaction, 2025



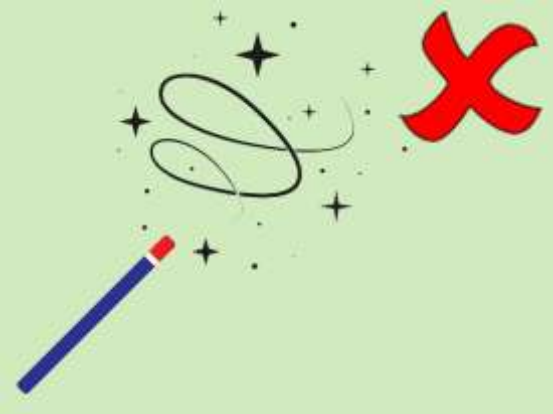
The Origin of Time, 2025



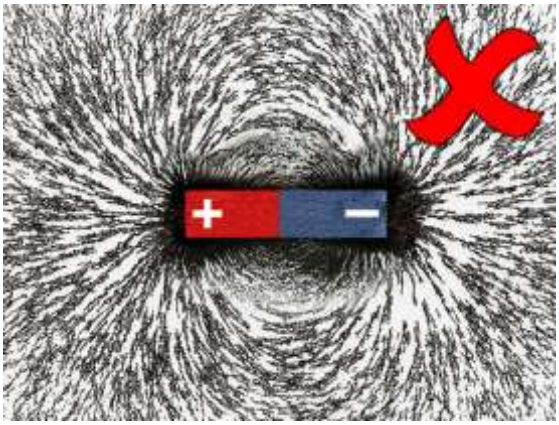
The Properties of Light V2, 2025

Foreword

My concerns



Stop believing in magic



There are no +ve and -ve changes

Purpose of this paper

Introduction

- My friends often advice me to shut my mouth and keep my opinions to myself.
- The few scientists that I know seem annoyed that, as an engineer, I should even be sticking my nose into the world of astrophysics.
- But I don't like what I see when I look into the current world of astrophysics.
- I particularly don't like the explanations presented by Einstein (Yes; I know; how sad of me).

We need to stop believing in 'magic'

- I want to find explanations that I feel are based on physics, rather than what appears to be an acceptance of 'magic'.
- To say that planets curve spacetime just sounds like a belief in magic, rather than a search for the truth.
- I know that Einstein was 'infinitely' smarter than I will ever be, but his ideas just don't ring true to my ears.
- Light does not travel at the speed of light just because it is 'light'—it does it because of physics.
- Sound does not travel at the speed of sound just because it is 'sound'—it does it because of physics.
- If we don't understand the physics, then we can speculate an answer, but we should never stop looking for the truth.
- When we accept 'magic' as the answer, then we are telling young minds that we no longer need to look for the physics.
- When we teach students that magnets have positive and negative ends with positive and negative charges, then we are telling these students to believe in magic—that is not a physics lesson!

The purpose of this paper

- I do not accept the idea of curved spacetime.
- I do not accept that light travels at a constant speed.
- I do not believe that all sound waves travel at Mach 1.
- I do not believe in positive and negative charges.
- I believe in physics.
- I believe a true explanation of the universe should be simple to understand because the physics would not have been complex.

Foreword

Albert Einstein (1904)

Are you ready for the big bomb shell?

Einstein's theory of relativity

- In my opinion, Einstein's special theory of relativity, and his general theory of relativity, are both wrong.
- I cannot help to feel that I am the small boy in the crowd that has just cried out that the Emperor is wearing no cloths.
- Einstein's theories are wrong because he started with the wrong assumptions, specifically a false understanding of fluid mechanics and wave theory.

Albert Einstein (1920)

Einstein's special relativity

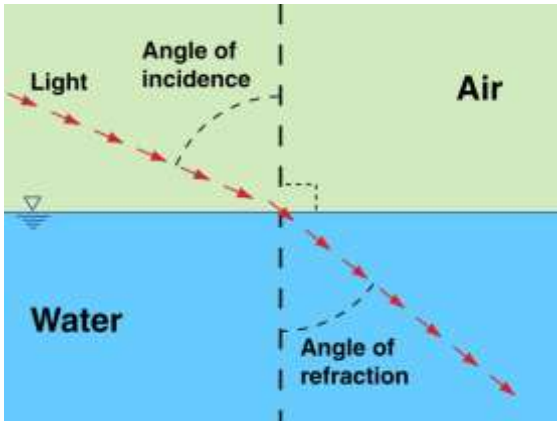
- Albert Einstein linked his theory of special relativity to two assumptions:
  - The laws of physics are invariant (identical) in all inertial frames of reference (i.e. frames of reference with no acceleration).
  - The speed of light in a vacuum is the same for all observers.

My training has allowed me to recognise an error in the way that Einstein viewed the wave-like behaviour of light.

Einstein's falling man

The laws of physics are invariant

- When Einstein considered the case of a man falling from a building, he concluded that the man would not feel the force of gravity, which meant that his condition would be the same as a person floating in space.
- However, this conclusion is wrong!
- A person would not feel the force of gravity because gravity is an internally-acting force, not an external force (which is the only type of force that a person could feel).



Refraction of light

The speed of light in a vacuum

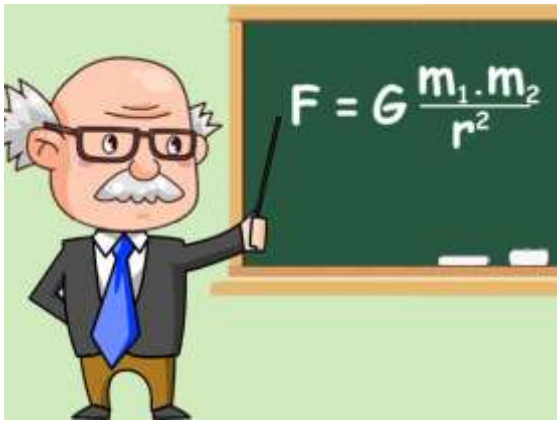
- The movement of light in a vacuum is NOT the same for all observers.
- The speed of light is governed by the speed of causality within the media through which it travels.
- Each observer exists within their own 'speed of causality', which means they exist within their own 'time', which means every observation is unique.
- I do not share Einstein's views on the properties of 'light' and 'time'.

Foreword

The Big Bang

A force-based model of our universe

- Our current understanding of the universe is based on energy being the primary product of the Big Bang.
- What I am proposing is a review of this case, but with forces being the primary product of the Big Bang instead of energy.
- What I am proposing does not change the actual 'science', it only changes the explanation of the science.



Gravitational equation

Gravity would still work

- It does not matter if we say that 'space' is filled with energy, forces, or miniature boxing kangaroos, our laws of physics remain unchanged.
- Gravity would not change, but our understanding of what causes gravity may change,
- However, the gravitational equation may need to change, just slightly (more later):

$$F = (G.m_1.m_2)/r^2$$

Rockets

Our programming of spaceships would remain unchanged

- With the change from 'energy' to 'force', the Apollo rockets would still have reached the Moon.
- Our communication satellites would still orbit the Earth.
- Our exploration craft would still fly past the outer planets before entering deep space.
- A force-based model of our universe will not change any of the sciences, it will only change our explanation of the sciences.

A vacuum!

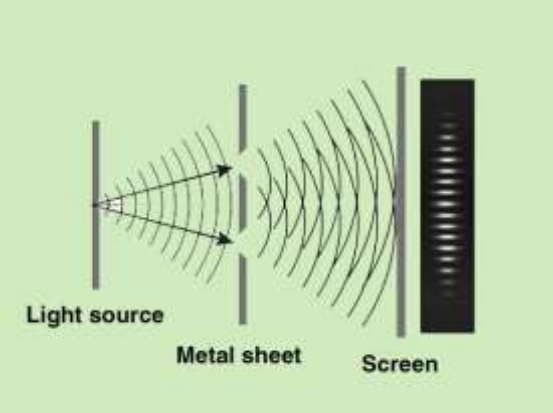
A 'vacuum' remains a vacuum

- All words are invented.
- All words can retain whatever meaning a society wishes to apply to that word.
- If the region of 'space' that we currently call a 'vacuum' does actually contain items such as: dark matter, energy, or quantum forces, then we, as a functioning society, can still choose to call that condition a 'vacuum', it is just that it will not be a true vacuum.
- A true vacuum only exists outside of our universe.

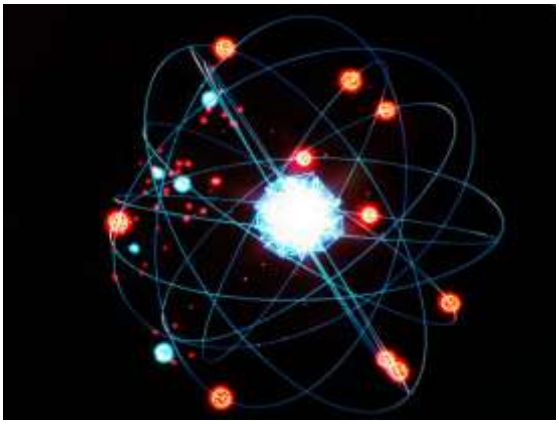
Foreword

Gravity

Spinning Earth



Double slit experiment



Atom

Outcomes of a force-based model of the universe

- A force-based model of the universe can provide us with a clear and logical explanation of the following scientific questions:
  - The link between the four known interactions.
  - Justification of the singularity outcome.
  - An explanation of gravity.
  - Why there is no such thing as a ‘pulling’ force, nor a ‘force at a distance’.
  - An explanation of what a magnetic field is made of.
  - An explanation of why a magnetic field always moves to the right when passing through another magnetic field.
  - What allows certain elements to become magnetic.
  - What causes stars, planets and moons (that have a magnetic field) to spin.
  - What causes Earth’s magnetic field to deflect solar wings.
  - What causes returning spaceships to deflect off the Earth’s ‘atmosphere’ if they approach at an acute angle.
  - The properties of light.
  - An explanation for the outcomes of the double slit experiment.
  - An explanation for the outcomes of the triple filter experiment.
  - What allows us to see stars clearly from any location.
  - The reason why the force of gravity reduces with the square of the distance of separation.
  - The reason why electrons are located in shells around a nucleus.
  - The force that causes an electron to stay in orbit around a nucleus.
  - The reason why the universe expanded primarily in two dimensions rather than three dimensions.
  - A possible reason for changes in the rate of expansion of the universe over time.
- Each of these issues will be discussed within this paper.

Executive summary

The following is a summary of the physics of our universe as developed through the application of a force-based model of the universe. The indicated page numbers are approximate only.

1. The beauty of a force-based model of the universe is its ability to demonstrate that every thing, and every action, that exists and has existed within our universe, originated from just two actions: repelling forces, and the speed of causality.
2. The substance that produces this repelling force could be given any title of our choosing, be it energy, aether, or miniature boxing kangaroos. I chose the term 'quantum force' because it is easier to imagine a 'force' being exerted by a force. (p41)
3. The speed of causality is important because its existence means that no action can be instantaneous across a region of 'space'. The speed of causality means that there is always a delay in the actions of forces. It is the speed of causality that gives us the properties of mass, momentum and inertia; and it is the speed of causality that gives us the property of time. It is also the speed of causality that brings a degree of chaos to the formation of the universe. (p53)
4. Our universe exists as an illusion formed from the actions of 'forces', which have no physical existence. The illusion originates from the fact that we (i) see, (ii) touch, (iii) smell, (iv) hear and (v) taste (i.e. our five senses) solely through the actions of forces, which themselves, have no physical existence. (p48)
5. Before the Big Bang there was 'nothing'. After the Big Bang we obtained the creation of the universe. If it can be demonstrated through a force-based model of the universe that the universe exists only as an illusion, then that would satisfy the scientific claim that matter cannot be created, nor destroyed (i.e. if there was nothing before the Big Bang, then there must be nothing after the Big Bang—this is the *Theory of Nothing*). (p50)
6. We can conclude that a quantum force has no physical existence because we can observe that a magnetic force has no physical existence. If we consider the repelling forces that exist between two magnets of the same polarity. This force cannot be (i) seen, (ii) touched, (iii) smelt, (iv) heard, or (v) tasted, and we also speculate that this force could exist within a true vacuum. Therefore, the force that exists between two magnets has no physical existence, and no specific dimensions, it simply fills the space that is made available to it. (p41)
7. Quantum forces may have no physical existence, or specific dimension, but they do occupy a region of influence, which can expand to fill any space, or collapse into a singularity. (p43)
8. Quantum forces have only one action, that being to repel all other quantum forces. (p43)
9. Quantum forces can exist in three states: (1) a free state, which is constantly expanding within our universe, and which represents the bulk of what is called 'dark matter'; (2) an attached state, which both surrounds, and travels with physical matter, and (3) a heavily concentrated state, which is what forms what we know of as 'physical matter'. (p44)
10. Of course, all quantum forces exist at some level of concentration, but when a zone of free quantum forces experiences an increase in concentration above the current background concentration, then the surrounding free quantum forces will push towards that concentration, which can cause the concentration to increase in size and density, and can cause the surrounding quantum forces to becomes 'attached' to the concentration. (p119)
11. All quantum forces have mass, which is a property that is generated by the effects of the speed of causality. The sum of mass of all the quantum forces represents the total mass of the universe, of which most of this mass is either 'free' or 'attached' quantum forces, which together make-up 'dark matter'. (p65)
12. The detection of gravitational waves confirms that 'space' must be a fluid-like continuum, without regions of empty space. This is because gravitational waves cannot move through a true vacuum. (p20)
13. Consequently, there is no such thing as a true vacuum within our universe. Also, the expansion of quantum forces from a singularity would have prevented the formation of any regions of empty space. (p149)

14. Space behaves like an ideal fluid (or superfluid), which means that physical matter is able to move in a frictionless manner without turbulence. During such movement, the attached quantum forces will move with the physical matter that they are attached to. This movement will induce some movement within the surrounding free quantum forces. (p30)
15. Matter will only experience frictionless movement through 'space' while it is travelling at speeds less than the speed of light. (p68)
16. The repelling force generated by 'space' is assumed to decrease with the square of the distance of separation. This force varies with the square of the distance because the surface area of the sphere of influence increases with the square of its radius. (p30)
17. The very existence of the universe tells us that there must be a time delay between every 'force' and its corresponding 'reaction', otherwise, the universe would have progressed from the Big Bang to its ultimate conclusion in an instant (i.e. in zero time). Therefore, even though every force has its equal and opposite 'reaction force', there is always a delay between the generation of this reaction. (p59)
18. Consequently, it can be concluded that 'time' exists solely as a consequence of this delayed reaction. Therefore 'time' must exist solely as a consequence of the speed of causality. This means that the 'aging' process must be directly inked to the local speed of causality. (p59)
19. From the behaviour of 'light' we learn that (i) light is not a particle wave, but an energy wave; (ii) it is not a transverse wave, but a longitudinal compression wave; and (iii) it is not electromagnetic radiation, but is able to generates such radiation through its movement. (p73)
20. A photon of light is not a stable concentration of quantum forces; instead, it exists as a transient concentration (i.e. a compression wave) in a similar manner to that of sound waves. Sound waves travel as a transient concentration of the media through which they are travelling. Both sound waves and light waves move as compression waves (energy waves), not as particles, or particle waves. (p70)
21. The double slit experiment proves that light must travel as an energy wave, because only energy waves can experience constructive and destructive interference. (p81)
22. The assumption that light travels at the speed of causality in 'space' also proves that light must travel as a compression wave, similar to sound waves, because if light travelled as a particle wave, then it would achieve infinite mass while travelling at the speed of causality. (p71)
23. The refraction of light tells us that the speed of causality varies with the inverse of the density of the free and/or attached quantum forces associated with the media through which the light is travelling. (p76)
24. The above statement makes the assumption that 'light' can only travel through either 'free' or 'attached' quantum forces, but not through concentrated quantum forces (i.e. physical matter). (p72)
25. This means that when 'light' is travelling through physical material, such as air, water or glass, it can do so because it is moving as an energy wave through the attached quantum forces that exist throughout the material. (p76)
26. This means that the energy of 'light' can also travel into non-translucent materials via the attached quantum forces that exist within these materials. However, the energy of this 'light' is absorbed by these materials. This process usually results in the generation of heat.
27. Heat (or temperature), is a measure of the density of free and/or attached quantum forces; therefore, the energy of 'light' must be able to increase the density of free and attached quantum forces within physical matter.
28. Magnetism is generated by the movement of free and attached quantum forces. (p97)
29. Electricity is generated by the movement of concentrated quantum forces (electrons), which will automatically generate a magnetic field caused by the movement of the quantum forces attached to each electron. (p109)

30. The reason why electrons are located in 'shells' that are separated by fixed distances from a nucleus is because of the repelling force that exists between the electrons of different shells. The separation of these shells varies with the degree of external pressure. (p134)

31. An electron is considered (by the author) to be the smallest stable concentration of matter. (p97)

32. A force-based model of the universe tells us that everything in the universe was created from forces. This means that the solar winds projected by the Sun towards the Earth are made from the same forces that make-up Earth's magnetic field. This explains how Earth's magnetic field, which is formed from a flow of quantum forces, is able to deflect solar winds, which consist of a compression wave of these same quantum forces. (p108)

33. The deflection of quantum forces by other quantum forces is also the reason why a returning spacecraft, which carries its own shield of attached quantum forces, can be deflected by Earth's magnetic field, if the spacecraft arrives at an acute angle. It is the author's opinion that such deflections have nothing to do with Earth's atmosphere. (p107)

34. Free quantum forces cannot move freely through a field of free quantum forces; however, a concentration of quantum forces (i.e. matter) can move freely through a field of free quantum forces. Also, a higher concentration of free quantum forces can push against, and move, a lower concentration of quantum forces, just like varying air pressures. (p145)

35. Free and attached quantum forces can only pass through (i.e. penetrate) a field of free or attached quantum forces when they are being carried by physical matter. It is for this reason that temperature stratification can occur with still air, or still water. (p108)

36. There is believed to be more than one action that can cause a planet to spin, but the most obvious cause is the fact that if the planet has a magnetic field, then the planet will function like a very large electric motor. This is because the rotating magnetic field that exists within the planet, also exists within a field of 'fixed' quantum forces attached to the planet. (p114)

37. What is interesting about the spinning of planets is that, just as an electrical motor can turn mechanical power into electrical power, as well as electrical power into mechanical power, a planet that generates spin because of meteor strike, can cause a magnetic field to start circulating within the planet (if it has an iron core), and the reverse action can also occur. So, a spinning planet could mean that the spinning caused the magnetic field, or that the magnetic field caused the planet to spin. (p114)

38. The driving 'force' behind the creation of the universe is the Gravitational Equation.

$$F = G.(m_1.m_2)/r^2 \qquad \text{(p115)}$$

39. However, according to the force-based model of the universe, the above Gravitational Equation is not complete because the force (F) approaches zero as the distance of separation (r) approaches infinity. In the force-based model of the universe, the background force of deep space is represented by the repelling force of the free quantum forces, which can be presented by the term; 'F_O'. Therefore, the true Gravitational Equation becomes:

$$F = G.(m_1.m_2)/r^2 - F_O \qquad \text{(p116)}$$

40. The revised Gravitational Equation (presented above) shows us that the net force (F) can transition from being an attracting force to a repelling force, even though all the quantum forces act as repelling forces. This outcome allows us to explain:

    - the links between the four know interactions
    - the repelling force of electrons (p117)
    - the forces that have in the past been associated with positive and negative charges
    - the strong and weak atomic interactions (p129)
    - the difference between the equations that describe the orbit of moons around planets, and the equations that describe the orbit of electrons around a nucleus. (p129)

41. This outcome allows us to finally reject all references to positive and negative forces and charges. (p96)

42. What makes the physics of moons orbiting a planet, different from electrons orbiting a nucleus, is the fact that a moon's orbit is a balance between gravity and centripetal forces, while an electron is held in its orbit solely by the forces of repulsion. Centripetal forces and the mass of the electron play almost no role in the physics of an atom. This means that the velocity of the electron is irrelevant to its stability, and an electron can be held in a stable orbit at almost any radius, and any angular velocity. The separation of 'shells' within an atom also arises from these same repelling forces. (p117)

43. If you place a heavy sphere (ball) on a mattress, it will sink into the mattress forming a depression. This depression stabilises the positioning of the sphere. If you place smaller spheres on the same mattress, then they will likely roll towards the deepest depression. The movement of the smaller balls towards the heavier ball represents attached quantum forces. The mattress as a whole, represents the free quantum forces. (p125)

44. If the refraction of light tells us that the speed of causality varies with the inverse of the density of free and attached quantum forces associated with the matter through which it travels, and if heat transfer is associated with a localised change in the density of free and attached quantum forces; then: (p139)
    - heat transfer must be associated with a change in the local speed of causality; which means, (p145)
    - temperature must be directly related to the speed of certain actions, atomic activity, and the 'aging' process of matter. (p63)

45. Heat exchange is the net movement of free quantum forces, which causes a change in the background concentration of free quantum forces within any region. This is different from magnetism because in magnetism there is an equal flow of quantum forces into, and out-of, a magnet. (p139)

46. Therefore, the release of heat caused by an atomic explosion is the expansion, and outward flow of quantum forces that have just been released from their previous concentrated state (i.e. matter being converted into free quantum forces). (p141)

47. There is currently an unchallenged rule that states something like: *'An electric current passing through the wire causes the magnetic field to exert a force. A moving charge in a magnetic field experiences a force perpendicular to its own velocity and to the magnetic field'*. The quantum force model tells us that this statement is not absolute. A force is only generated when the moving magnetic field is not moving in sequence with the moving magnetic field of the electrical wire. When the movement of two magnetic fields are in balance, then no force is generated, which is why an electrical motor does not keep accelerating. (p142)

48. The Big Bang resulted from the expelling of quantum forces from a singularity, which was caused by their repelling action. It is noted that the Big Bang is an event that is still occurring, and the universe continues to expand. (p148)

49. The author cannot be certain that the original singularity does not still exist, or that it has stopped releasing quantum forces. If it did still exist, then it would be continually adding to the total mass of the universe through its ongoing release of quantum forces. (p148)

50. The mechanics (physics) of how a field of free quantum forces can hold a concentration of quantum forces (matter) in a stable form is one of the most critical outcomes of the force-based model of the universe. (p120)

What I am presenting in this paper is, what I believe to be, the most logical explanation of the universe, while still holding to the laws of physics.

Contents

1. Introduction

Welcome

Introduction

- This introduction presents several ‘theories’, but without any supporting detail—the detail will come later.
- Some readers may find parts of this introduction hard to accept without the supporting details, and that is fine, I do realise that it is hard to accept such a radical change in thinking.
- But, please don’t give-up on this work until you have had a chance to review the subsequent chapters—thank you.

Space

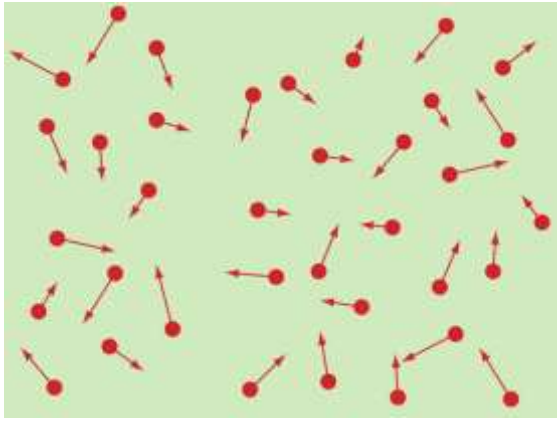
What is space?

- Our current (2026) understanding of the universe suggests that the Big Bang released only ‘energy’.
- I could have followed this line of thinking by saying that space if filled with energy or even aether, but instead I have chosen to consider space as being a continuum of quantum forces, which behaves like a superfluid.

Positive (pushing) force

Actions are created by forces

- Instead of thinking that every ‘action’ requires energy, we can consider that every ‘action’ that has occurred within the universe, including every action that created the universe, occurred through the action of forces.
- In fact, all five of the human senses are generated through the action of forces.
- Of course, these forces are ‘powered’ by energy, so a force-based universe is similar to an energy-based universe.



Random forces

A force-based model of the universe

- So, this paper simply takes the current energy-based model of the universe and replaces it with a force-based model.
- The benefit of a force-based model is that it gives us a different perspective; a different way of looking at the universe.
- Everything that exists within the universe, including every action that has occurred, is the result of just two things:
  - the force of repulsion (quantum forces)
  - the speed of causality of these forces.

Understanding our universe

There was no ‘bang’!

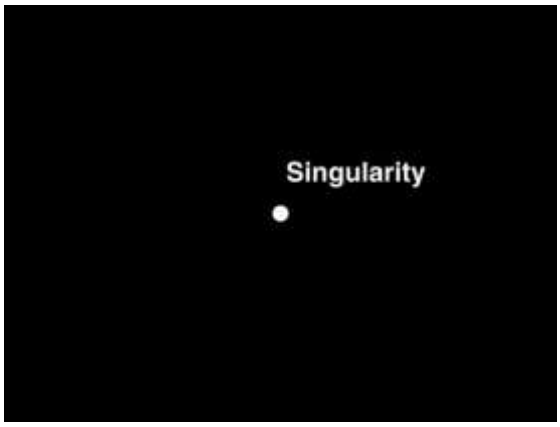
In the beginning

- The concept of a force-based model of the universe is founded on two ideas:
  - every action that occurs within the universe occurs because of the actions of forces, and
  - the Big Bang was not an explosion, but a rapid expansion, which resulted from the actions of these same forces.
- I have called these forces; quantum forces, on the basis that they are the smallest component of all known forces.

An expansion

The Big Bang

- It is only natural that humans associate the idea of a sudden expansion of the universe with the actions of an ‘explosion’ (i.e. a bang).
- However, there was no ‘bang’, or any form of noise—a ‘noise’ can only exist if there is a brain that can create such a sensation.
- The other thing to note is that the Big Bang has never stopped—the universe continues to expand today, just as it did in the beginning.



Singularity

The benefits of a force-based model

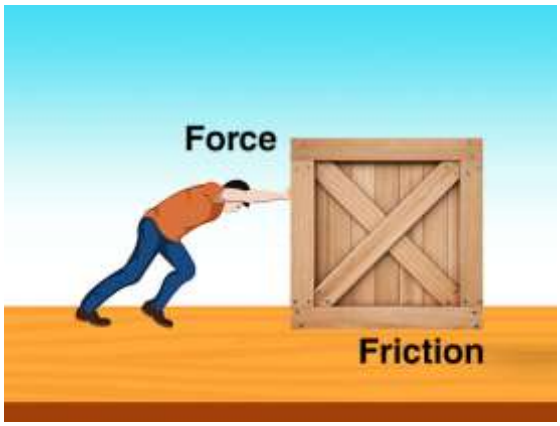
- The benefits gained from adopting a force-based model instead of an energy-based model can be summarised as follows:
  - we think of energy as something that can be consumed or depleted, but we don’t think of forces in the same way
  - we think of energy as something formed from some type of fuel, but a force has no physical existence, and
  - a force-based model allows us to explain the idea of a singularity.

Understanding our universe

The key to understanding the universe

- What I hope to demonstrate in this paper is that the key to understanding the physics of our universe is to understand the physics of just two things:
  - forces, and
  - the speed of causality.
- I can only hope that one day your brain will allow you accept the idea that our complex universe was generated from the actions of just these two things, which is why everything in the universe has a simple explanation based in physics.

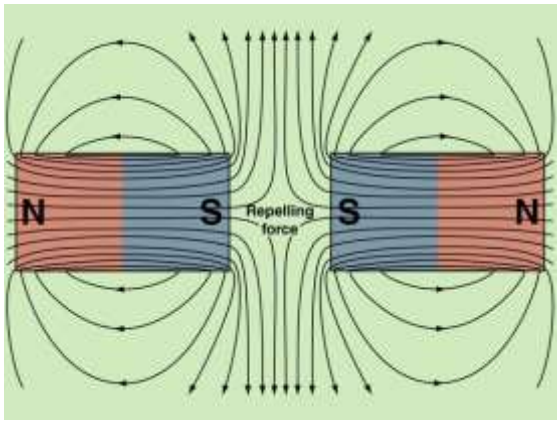
The action of forces



A repelling or pushing force

Introduction

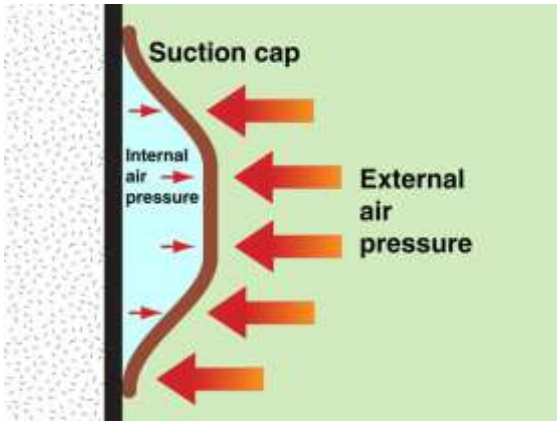
- What really is a ‘force’, and does a ‘force’ have dimensions?
- Most people can provide you with examples of things that can produce a ‘force’, but this is different from knowing what a ‘force’ really is.
- Similarly, most people can give you examples of things that can produce ‘fire’, but how many can tell you what the flames of a fire are made of.



Repelling magnetic force

Does a force have dimensions?

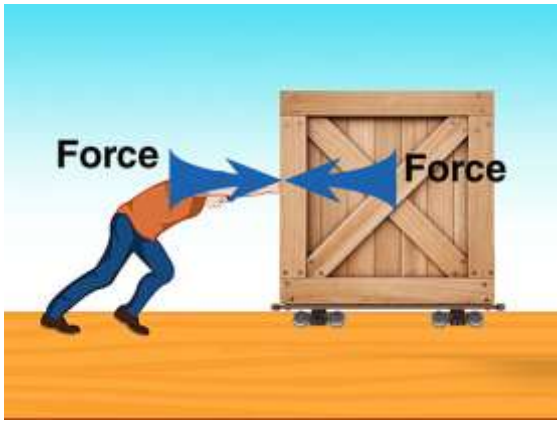
- Consider the forces that exist between two magnets when the same magnetic poles are presented to each other.
- Does this force have dimensions?
- Is it possible to push the magnets together such that the ‘space’ filled by these forces is reduce to zero?
- In theory, a force is dimensionless, but the force can act over a ‘region of influence’, which has no fixed dimensions.



Suction cap

A force is always positive

- All forces are pushing forces.
- There is no such thing as a ‘pulling force’.
- There are actions that can produce a pulling force, such as in a car tow rope, but these actions are all generated by atomic ‘pushing’ forces.
- Similarly, there is no such thing as a suction force—a ‘pressure’ can only be a positive pressure—there can never be a true negative pressure.



Applied force and the reaction force

Newton’s third law of motion

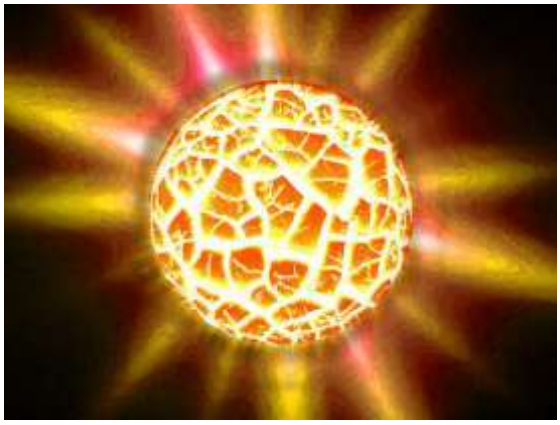
- Newton’s third law of motion effectively states:
  - *When one body exerts a force on a second body, the second body exerts an equal and opposite (opposite in direction) force on the first body.*
- What Newton’s third law of motion didn’t describe is whether or not there is any time delay between the application of the initial force, and the generation of the equal and opposite force—this leads up to the issue of the speed of causality.

The speed of causality

Time

Introduction

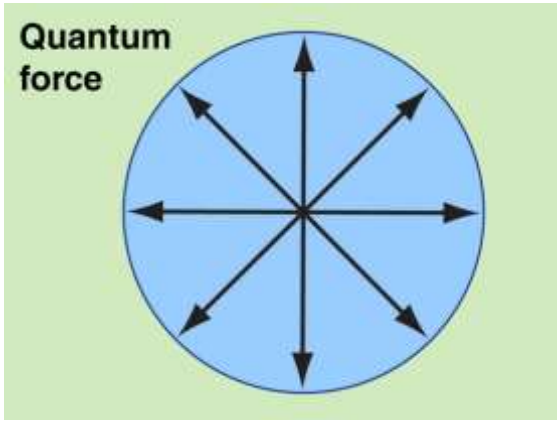
- Another key issue of astrophysics is 'time', or more importantly, what generates time, which is the same speed of causality.
- Let me state my theory:
  - 'time' is not an independent variable that existed prior to the Big Bang
  - there is no such thing as 'spacetime', or curved spacetime (sorry Einstein)
  - what we know of as 'time', is simply a consequence of the speed of causality.



The Big Bang

The lifespan of our universe

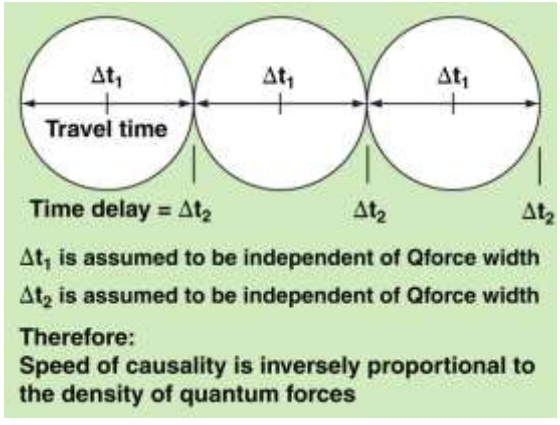
- If we accept that every 'force' generates an equal and opposite force, and that every 'action' generates a reaction, then we must accept that there must be a time delay between each action and its reaction, otherwise, our universe would have progressed from the Big Bang to its ultimate collapse, instantly (i.e. zero time).
- **The very existence of the universe demonstrates that there must be a time delay between all 'actions' and their corresponding 'reactions'.**



Region of influence

The origin of 'time'

- What we know of as 'time', must simply be a consequence of this time delay.
- When an external force is applied to a quantum force, there must be a time delay before that quantum force:
  - transfers the force across the region of influence of that quantum force
  - crosses the boundary between two regions of influence (i.e. the boundary between to quantum forces).

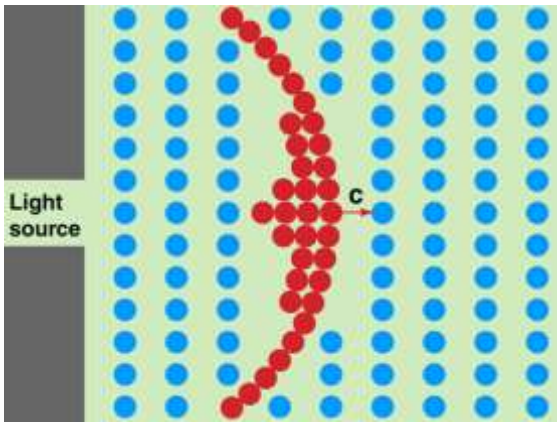


Speed of causality

Speed of causality

- The term 'speed of causality' has traditionally been associated with the speed of light, but in simple terms, it refers to:
  - the speed of a force message, or
  - the speed of any action performed by quantum forces.
- However, the term can also be applied to the speed of a force message passing through a fluid, such as: space, air, or water.

Commonly asked questions



Light as a compression wave

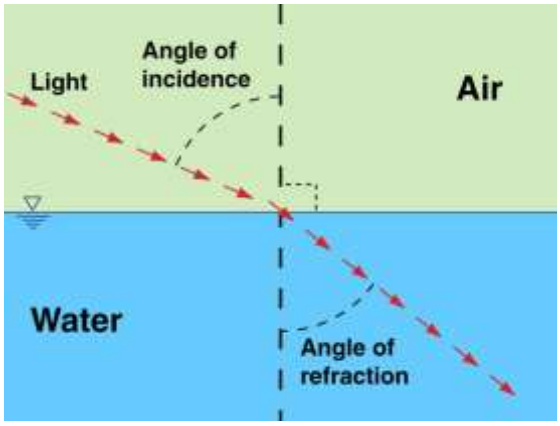
Is 'light' a particle or a wave?

- Light is not a particle—it is a compression wave, just like sound waves.
- Light travels as a compression wave of quantum forces travelling through a field of quantum forces.
- Light travels at the speed of causality, which is the maximum speed that a force message can pass from quantum force to another.
- Light also travels as a shock wave because it travels at the critical velocity of space.

Detection of gravitational waves

Does 'space' contain regions of empty space?

- Space is not empty; it is a continuum of quantum forces.
- We know that space is a continuous fluid because of the existence of gravitational waves, which cannot move through empty space (a true vacuum).
- The Big Bang did not 'explode' individual units of energy into the emptiness of space; it expanded an almost endless quantity of quantum forces to form a continuous fluid.



Refraction of light

Is the speed of 'light' constant for all observers, no matter what their speed?

- I am sorry to say this, but Einstein's theories of relativity are false, because one of his initial assumptions was false.
- Light travels at the speed of causality, which is the speed of a force message.
- The speed of a force message varies with the inverse of the density of the quantum forces, which is equivalent to the density of matter; hence, light slows its velocity when it passes through a substance.

Time

Is time travel possible?

- Of course time travel is possible—even as you read this paper, time is progressing, so you have just travelled through time!
- But 'time' is not what we have been led to believe that it is—you have been told a lie.
- Time is simply a consequence of the speed of causality, which is the speed of an action—time is a measure of the speed of actions generated by quantum forces.
- The passage of time can only be positive, even if an action were to be reversed.

2. Fluid Mechanics and the Properties of Waves

Introduction

Water engineer

Introduction

- I entered the world of astrophysics not through the sciences, but through the profession of civil engineering.
- My chosen area of specialty was water engineering, specifically, fluid mechanics.
- This is a long chapter, and the topic may not seem relevant to astrophysics, but trust me—it is—space behaves like a fluid, and light moves as a wave.
- There is also a lot of new information to be absorbed, so it could be a difficult read!

Bow wave

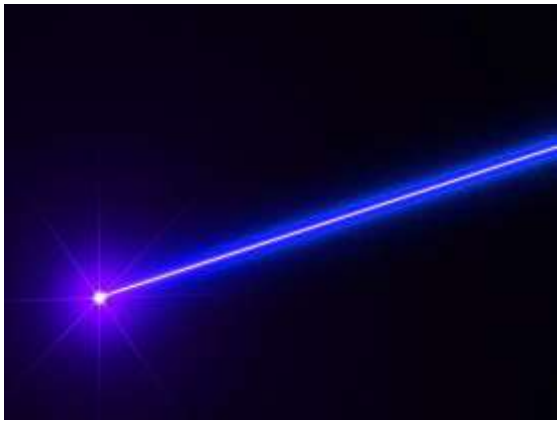
The movement of fluids

- If a fluid is being pushed aside by an external force, then the fluid will 'choose' one of three types of responses:
  - 1st preference is to move out of the way by pushing something 'lighter' out of the way ('lighter' is actually the wrong description)
  - 2nd preference is to move out of the way by accelerating its velocity
  - 3rd preference is to move out of the way through a process of physical compression.

Jar of water

Fluids

- There are two fluids that engineers regularly deal with:
  - air, and
  - water.
- Less common fluids include:
  - viscous fluids like honey or oil, and
  - non-Newtonian fluids.
- However, in astrophysics there is another fluid that takes centre stage, that being 'space'.



Beam of light

The speed of sound and light

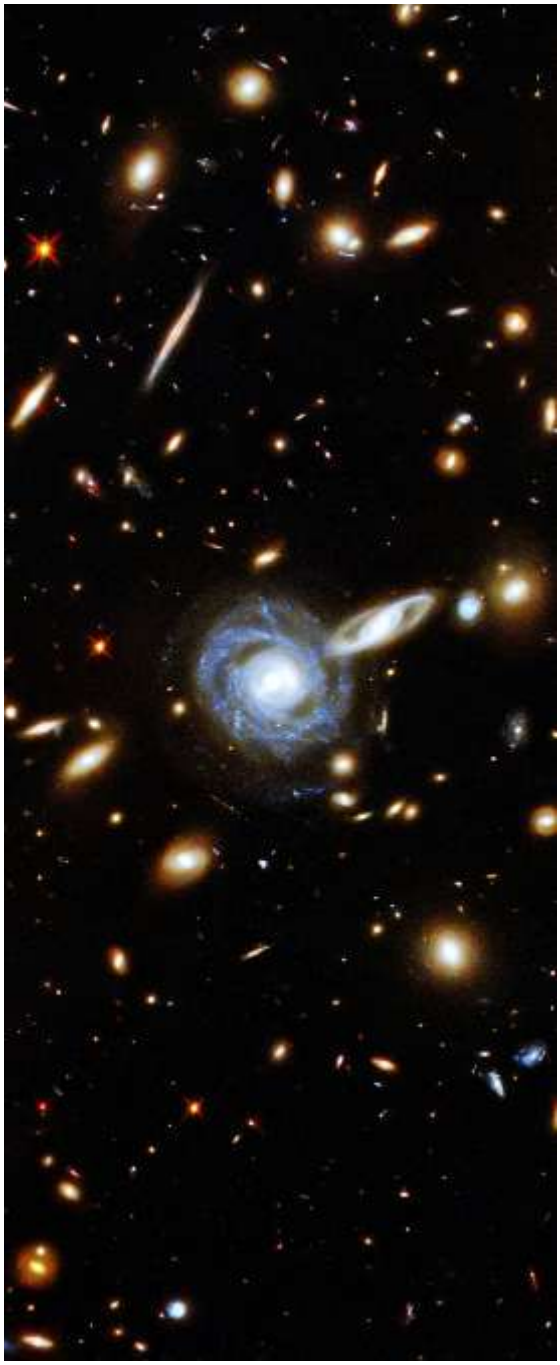
- Sound does not travel at the speed of sound because of some type of magic.
- Similarly, light does not travel at the speed of light for a random reason.
- There is physics and mechanics involved in how sound and light travels, and an understanding of this physics can greatly assist us in understanding the universe.
- The physics of 'space' incorporates the properties of both fluids and waves.

What fluid mechanics can bring to the science of astrophysics

Fluid mechanics (USA)

Introduction

- If I had my way, every student studying astrophysics would spend some time studying fluid mechanics and wave theory.
- If you cannot accept that space acts like a fluid, then there is little point in you reading any further.
- I know that space behaves like a fluid because I can recognise so many fluid-like properties in the way that space behaves.



Space

The answers that fluid mechanics can bring the science of astrophysics

If you are not convinced of the value of fluid mechanics, allow me to list all the 'answers' that fluid mechanics can provide the world of astrophysics.

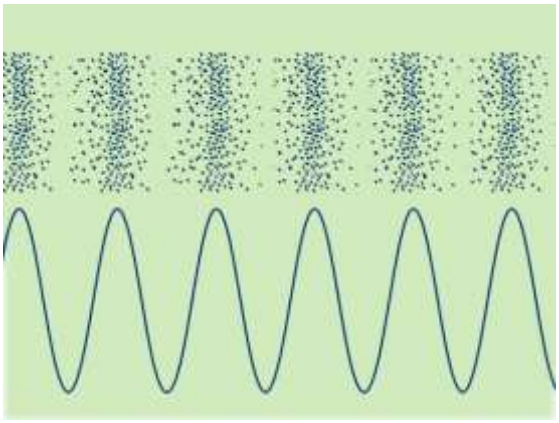
1. The cause of planetary spin.
2. A full explanation of the double slit experiment.
3. A full explanation of the triple filter experiment.
4. The reason why 'light' travels at the speed of light.
5. The reason why 'sound' sometimes travels at the speed of sound.
6. Why all colours travel at the same speed.
7. The reason why white light can produce a rainbow of colours.
8. The reason why blue light is so easily deflected by the atmosphere.
9. What generates the property of mass, momentum and inertia.
10. The reason why solar radiation is deflected by the Earth's magnetic field.
11. The reason why returning space craft can be deflected off the Earth's atmosphere.
12. The mechanics of heat transfer.
13. The common link between gravity, magnetism, and the strong and weak atomic interactions.
14. The make-up of magnetism and electricity.
15. The actions of gravity as a 'force'.
16. The origin of 'time'.
17. The importance of chaos theory in the formation of the universe.

The speed of sound

Sound waves

Introduction

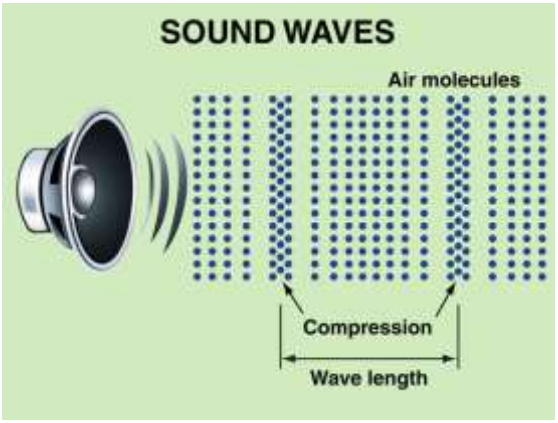
- Based on the English language, the 'speed of sound' could mean:
  - the speed of any sound wave, or
  - a specific speed, which is based on the maximum speed of sound in air, which is often referred to as Mach 1.
- Throughout this document I will adopt the latter definition; consequently, allow me to state that not all sound waves travel at the 'speed of sound'.



Sound waves

The movement of sound

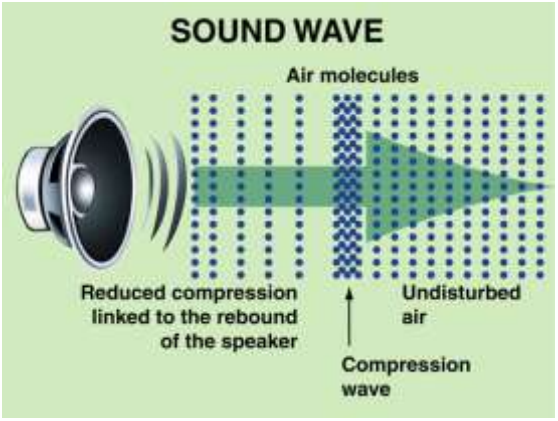
- We first need to understand that a sound wave is just a compression wave of the media through which it travels.
- If we accept that any compression wave of air could be classified as 'sound', then a weather front, which is a compression wave of air, could be classified as a non-audible sound wave.
- A compression wave of air can take many forms, and it is the form, or profile, of the wave that determines its speed.



Sound waves

The movement of air

- Air behaves like a fluid, and just like any fluid, when air is pushed by an external force, its options are:
  - 1st preference is to push something 'lighter' out of the way (very rare)
  - 2nd preference is to move out of the way through a process of acceleration
  - 3rd preference is to move out of the way through a process of compressing the air particles.

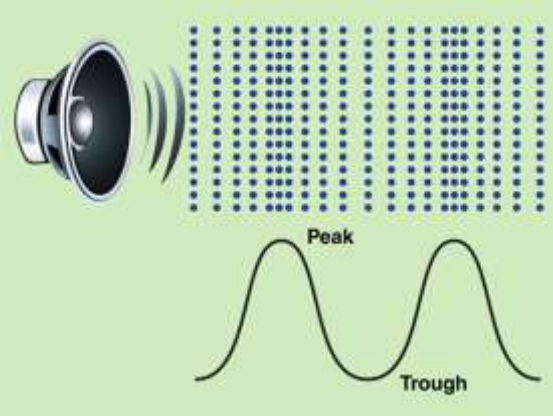


An abrupt compression wave

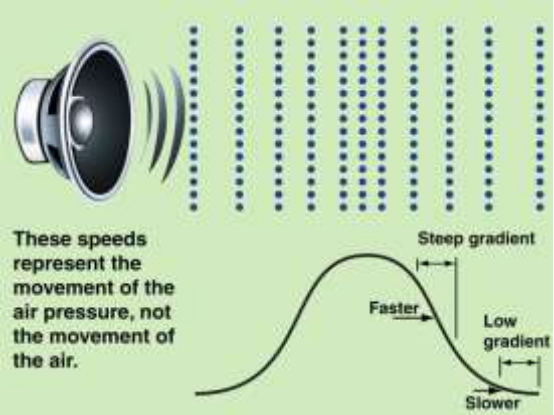
Compression waves of air

- To be clear, air is always compressed to some degree, and any increase in air pressure will result in an increase in the air density.
- In fact, everything within our universe is in a state of compression.
- A compression wave of air can take the form of:
  - a gradual increase and decrease
  - a rapid, or abrupt, increase, such as in the case of a 'shock wave'.

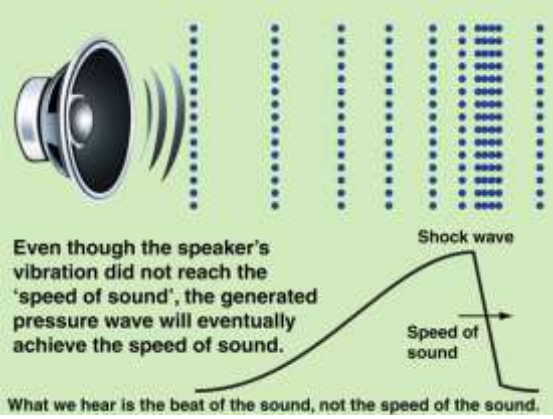
The speed of sound



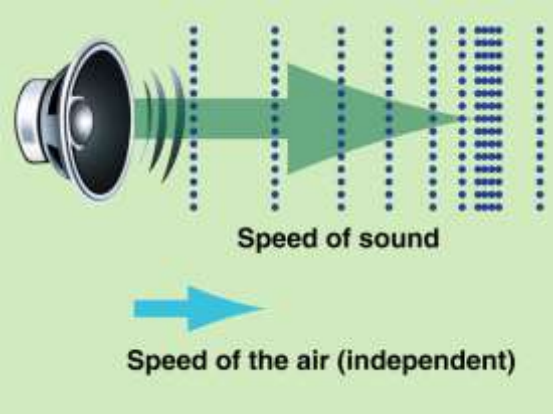
Sound wave



Speed of the pressure transfer



Speed of sound



The influence of the air speed

The speed of sound

- Whenever air moves freely it will attempt to disperse any internal pressure variations that may exist in the air.
- This means that all compression waves of air are unstable, and thus all sound waves have a limited 'lifespan', and therefore a limited distance of travel.
- The speed of the pressure transfer that occurs within a compression wave (i.e. the speed of the wave) depends on the pressure gradient and its viscosity.

The movement of a gradual change in air pressure

- If the compression wave exists as a smooth 'sine' curve, with a gradual increase in air pressure, followed by a gradual decrease, then there can be two forms of movement:
  - the compression wave can slowly disperse, with its speed being governed by the pressure gradient
  - the pressure gradient can distort its leading edge until it forms an abrupt shock wave.

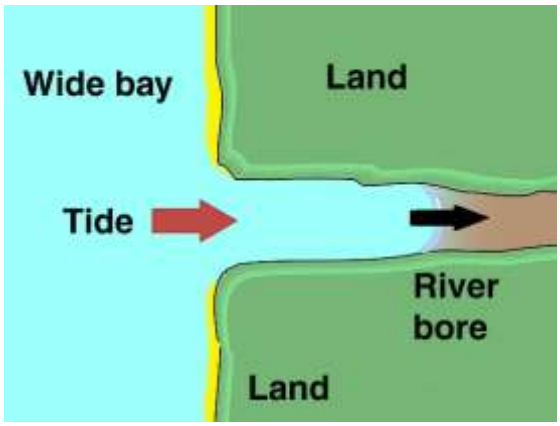
The speed of an abrupt change in air pressure

- In the first case, if the compression wave stays as a gradual sine wave, then the steepness of pressure gradient will constantly decrease, and so will its speed.
- In the second case, the compression wave will change its profile as it moves, and the pressure gradient, and the speed of travel, will steadily increase to a maximum—a similar outcome happens to ocean waves when they approach a coastline, form a peak, and then break or spill.

The speed of an abrupt change in air pressure

- If a sound wave forms an abrupt pressure front, then the pressure gradient approaches infinity (i.e. it is very steep).
- In this condition, the speed of the compression wave reaches its upper limit, which is the 'speed of sound', which is the maximum speed that air particles can cause a force message to travel—in other words, this is the speed of causality of air, **but** you must add, or subtract, from this speed, the velocity of the air through which the sound travels.

Discussion point: The formation of a tidal bore



River bore (tidal bore)

Introduction

- The scientific events that bring me the most enjoyment are those light bulb moments when you recognise a connection between the physics of two vastly different occurrences.
- As a part-time coastal engineer, I have studied the actions of tides, which includes the mechanics of tidal bores, but I had not, until now, drawn a connection between the human ear and the occurrence of tidal bores in rivers.

Tidal bore

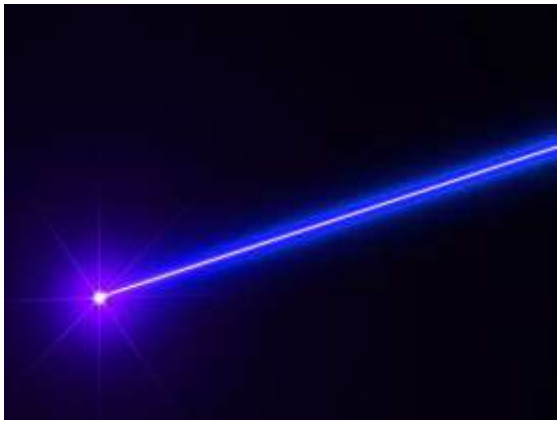
The mechanics of a tidal bore

- Tidal bores typically occur in rivers that discharge into a wide bay that has a significant tidal range.
- The action results from the fact that as the tide rises, and water levels in the river increase, the speed of the tidal flow increases, so the later part of the tide begins to catch the earlier part of the tide.
- This causes the tidal wave to compress and eventually form a near-vertical wave front, i.e. a ‘shock wave’.

Human ear

The mechanics of human hearing

- It is the author’s belief that the shape of the human ear, including the outer ear, middle ear and inner ear, all contribute to the conversion of a gradual pressure wave (that a human ear could not detect), into an abrupt pressure wave (or shock wave), which has the type of lateral movement needed to activate the earing sensors.
- The constant narrowing of the cochlea would allow a shock wave to form at different locations within the cochlea, which would allow us to register different frequencies.

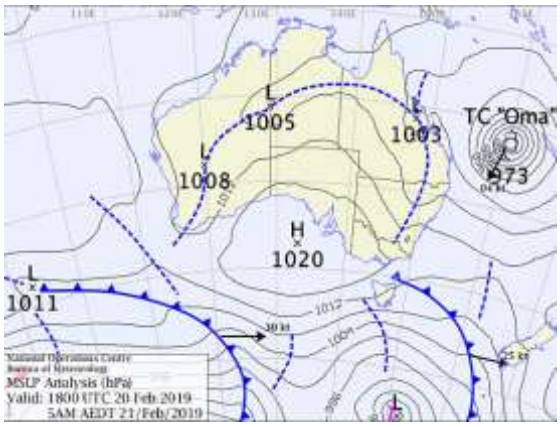


Light

The mechanics of ‘light’

- One of the aims of this paper is to demonstrate that this formation of an abrupt wave front (shock wave), also occurs in the early stages of ‘light’.
- Also, that it is the formation of this shock wave that ultimately governs the physics of the movement of light, and the generation of the ‘speed of light’.
- Light travels at the speed of light not because of magic, but because of the physics of a compression wave moving through a given media.

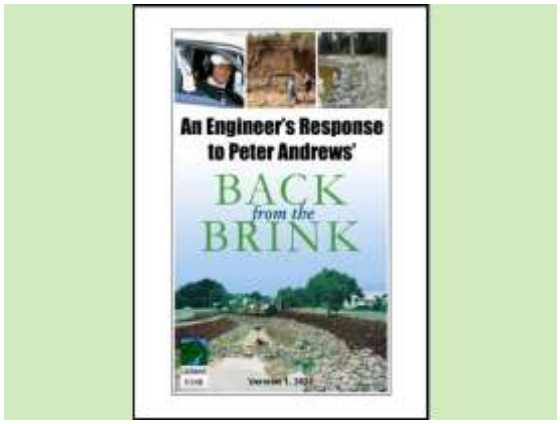
Discussion point: The movement of atmospheric pressure cells



Weather map

Introduction

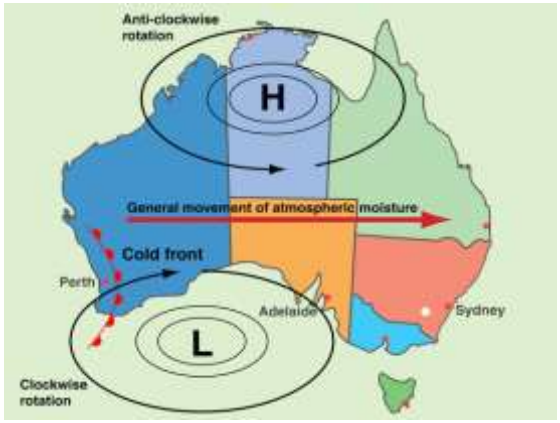
- Some weather maps show variations in air pressure, and how these weather fronts are likely to move across the landscape.
- But, does the air pressure move with the air, or separate from the air?
- And, does the heat move with the air pressure and the air, or does it move separate from both of these items?
- Air is a fluid, so fluid mechanics should be able to explain what is happening.



***Catchments and Creeks*, 2025**

The creation of high- and low-pressure cells

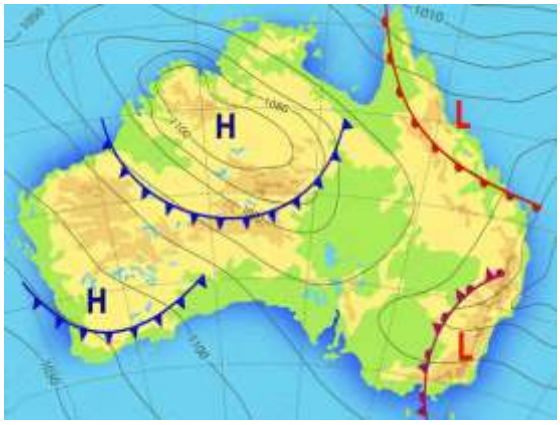
- Circulating high-pressure and low-pressure cells are formed within our atmosphere because the sun is heating different parts of the atmosphere at different rates, and because the Earth is spinning.
- A more detailed explanation of weather patterns is provided in the *Catchments and Creeks* field guide, *'An Engineer's Response to Peter Andrews' Back from the Brink'*.



High- and low-pressure cells

The movement of high- and low-pressure cells

- High- and low-pressure cells typically move in a direction that is 90-degrees to the direction of air flow, but that is a bit of a misleading statement.
- The fact is, both high-pressure and low-pressure cells rotate, which means the air movement within a pressure cell is approximately circular.
- The speed of these weather cells depends on many factors, most of which do not relate to the speed of a sound wave.



Weather fronts

The movement of a weather front

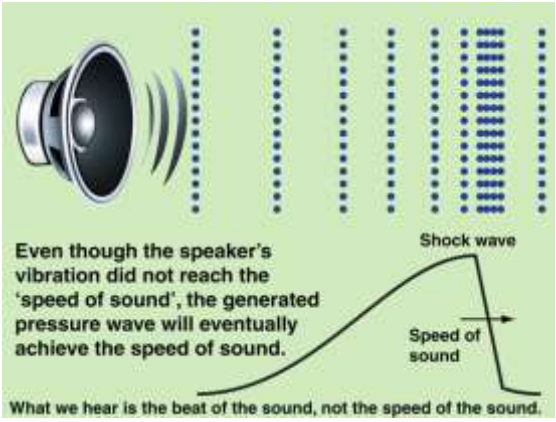
- It would be fair to say that nobody can hear an atmospheric pressure cell because the rate of variation in air pressure is too mild for the ear to detect.
- However, some pressure cells move in association with strong winds, and this pressure change, and its noise, will arrive with the actions of wind.
- Much of this wind noise does not travel at the 'speed of sound', but at a speed that depends on several factors, including the profile of the pressure gradient.

What we can learn from our understanding of sound waves

Lesson

Introduction

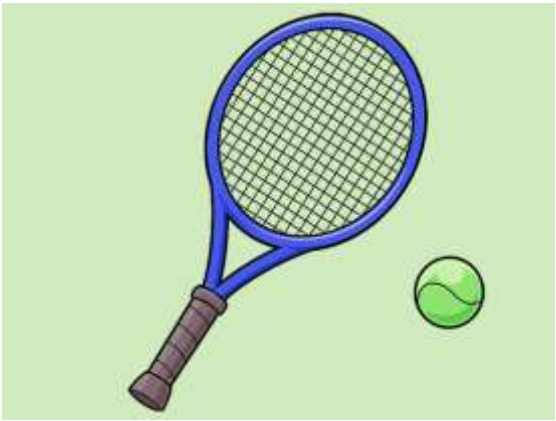
- The lessons we can learn from a study of sound waves, include:
  - we should not assume that all sound waves move at some 'magical' speed called the 'speed of sound'; instead, we should attempt to understand the actual physics
  - the speed of sound will always be relative to the 'speed of the media'
  - what we hear depends on the strength, frequency and profile of the pressure change, not on its speed.



Speed of sound

The 'speed of sound' (Mach 1)

- What causes a 'sound' to travel at the 'speed of sound' is the pressure gradient that is generated when a general compression wave converts into a shock wave.
- At the 'speed of sound' (Mach 1) an abrupt compression wave is able to achieve the maximum rate of pressure transfer relative to the speed of the media (i.e. the speed of causality for that action, and for that media).



Tennis

Consider the sounds produced in tennis

- When a tennis ball is hit, there is a good chance that the opposing player will hear the initial strike of the tennis ball.
- This noise will travel towards the opposing player at the speed of sound.
- As the ball travels through the air, it will generate a pressure wave, which is technically a sound wave, but this wave will travel at the speed of the ball, not the speed of sound, and it will only be heard if the ball passes close-by the player's ear.

Rifle shot

Consider the sound of a subsonic rifle shot

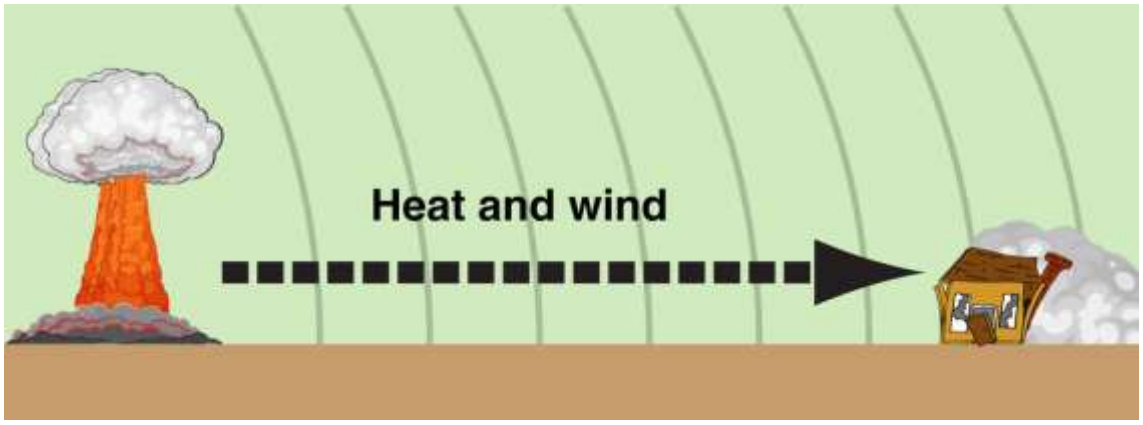
- If a rifle projects a bullet at a subsonic velocity, then the 1st sound to arrive at a distant observer would be the sound of the initial detonation (i.e. the bang), which would travel at the speed of sound.
- The 2nd sound experienced by a distant observer could be the sound of the bullet passing by the observer's ear.
- This second sound would be constantly generated by the moving bullet, and would travel away from the bullet at a speed less than the speed of sound.

Discussion point: The movement of heat from an atomic blast

Atomic explosion

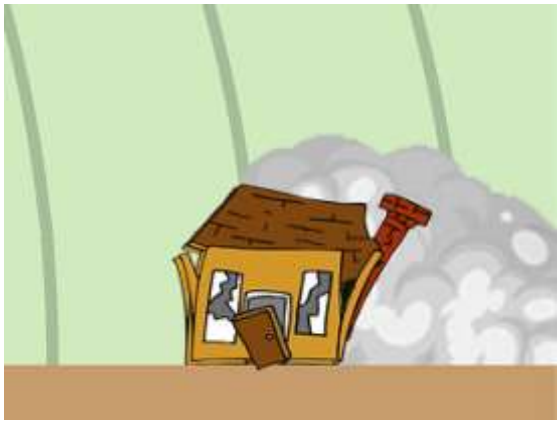
Introduction

- When an atomic blast occurs, distant objects very quickly experience a rapid increase in heat, air pressure, and wind velocity, but what are the physics involved in this rapidly changing event?
- Understanding the movement of the air, heat, sound, and air pressure, can help us to better understand the properties of fluids.
- And, we need to understand the properties of fluids in order to understand the physics of our universe.



The effects of an atomic blast

Atomic blast in the Pacific



Damage to a distant house

Outcomes of an atomic blast

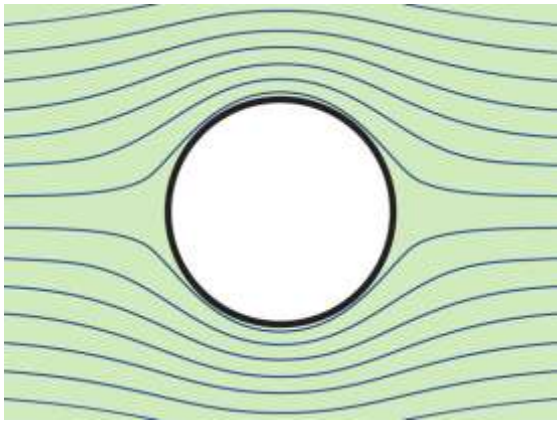
- The 1st action to arrive at a distant building would be the visual evidence of the blast, which travels at the speed of light in air.
- The 2nd action to arrive would be the shock wave and heat from the blast, but how does this heat arrive so quickly?
- The 3rd action to arrive would be the sound, which travels at the speed of sound in air.
- The 4th action to arrive would be the wind, which would likely commence immediately after the arrival of the shock wave, but this air (wind) would not have travelled from the blast site.
- So, what caused the heat to travel so fast?
- Some may tell you that the heat is produced by the severe compression of the air associated with the shock wave.
- But heat is a measure of the compression of quantum forces, and it is noted that the atomic blast just converted a small amount of matter into a massive amount of ‘free’ quantum forces, which travels as a shock wave, and which travels at a very high speed.

Space behaves like an ‘ideal’ fluid (superfluids)

Superfluid

Introduction

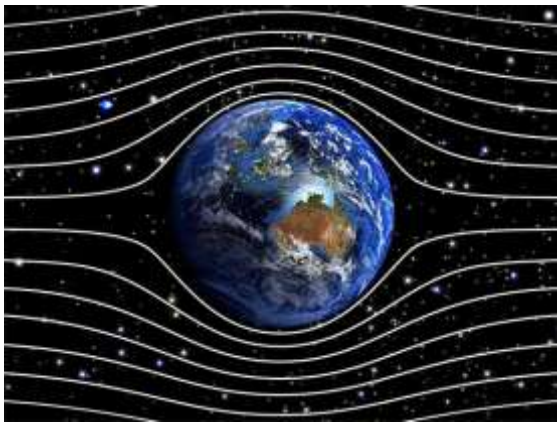
- An ideal fluid, or ‘superfluid’, is a fluid that does not experience friction or turbulence, but instead has the property of zero viscosity.



Flow line around an object

The properties of ideal fluids

- A superfluid moves with zero viscosity, which means objects of matter that are passing through a superfluid will experience zero friction.

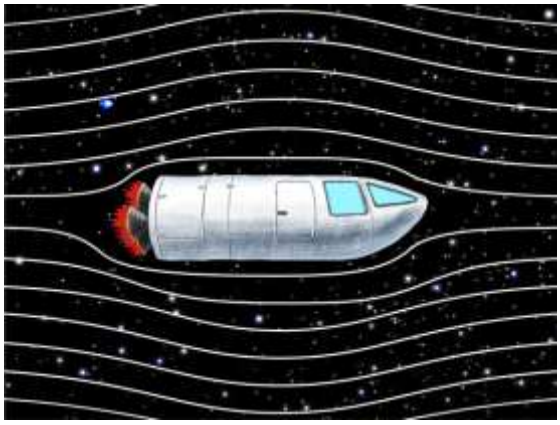


Earth

The movement of ‘space’

- The primary movement that ‘space’ experiences is the motion of expansion, which occurred without turbulence and friction.
- But ‘space’ also moves out of the way of moving physical matter, like planets.

This diagram (left) does not show the effects of Earth’s ‘shield’ of attached quantum forces, which is an issue that will be discussed in the next chapter.



Spacecraft

The movement of object through ‘space’

- Even though the substance that fills ‘space’ (i.e. quantum forces) has mass, it provides no resistance to the movement of objects through ‘space’, unless the speed of that object approaches the speed of causality (i.e. the speed of light).
- Thus, both planets and spacecraft move through space in a frictionless manner.

An introduction to the movement of water

The movement of water (USA)

The movement of water

- If water is being pushed aside by an external force, then the water will 'choose' one of three types of responses:
  - 1st preference is to move out of the way by pushing something 'lighter' out of the way (i.e. form a surface wave)
  - 2nd preference is to move out of the way by accelerating its velocity
  - 3rd preference is to move out of the way through a process of physical compression (rarely addressed in civil engineering).

Subcritical bow (car) wave

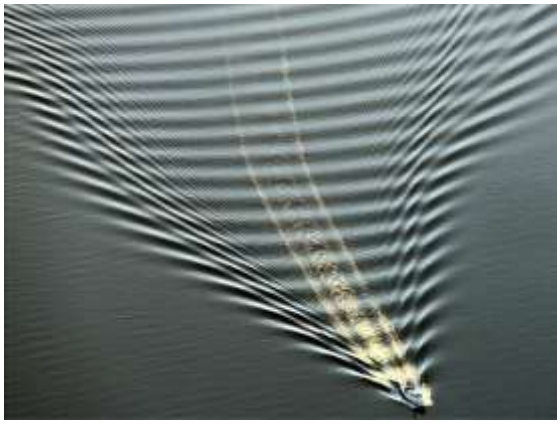
Subcritical flow

- When we are studying free surface flow, we have an interface between air and water, so if an external force is applied to the water, its first preference is to push the lighter substance (i.e. the air) out of the way, and thus form a surface wave.
- If the external force, say a car, is moving slower than the speed of a surface wave, then the car is considered to be moving at a subcritical speed, and the bow wave will position itself just ahead of the car.

Critical flow bow (car) wave

Critical flow

- If the external force, again a car, is moving at the speed of a surface wave, then the car is said to be moving at the critical speed of a surface wave, and the car's bow wave will be abrupt and perpendicular to the movement of the car.
- This means the force (the car) is being applied at the same speed as the force message (appearing in this case as a surface wave).

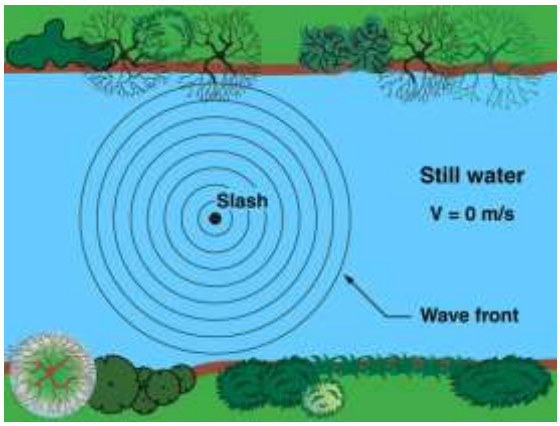


Supercritical bow wave

Supercritical flow

- If the external force, in this case a boat, is moving faster than the speed of a surface wave, then the boat is considered to be moving at a supercritical speed, and the bow wave will slowly fall behind the boat as the wave moves away from the boat.
- This action forms the classic V-shaped bow wave, and the angle of this V-shape can be linked to the Froude Number of the moving object (consequently you can determine the boat's speed from the shape of its bow wave).

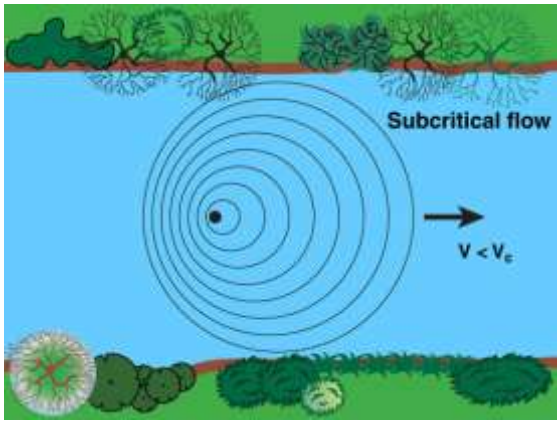
Critical, subcritical and supercritical water velocity



A stone thrown into still water

A rock thrown into a pond

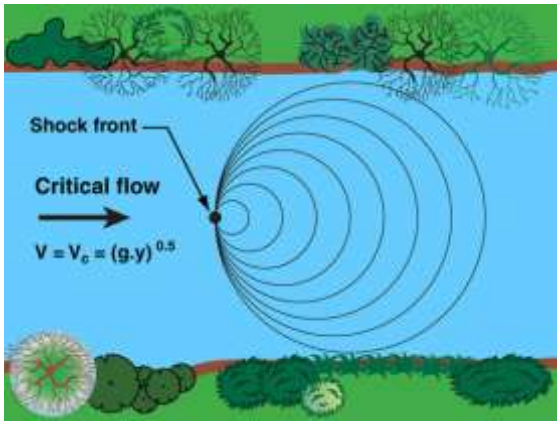
- Consider a rock thrown into a still pond.
- The surface waves travel as energy waves, which means that only the 'energy' of the waves moves—the water particles may move up and down, but they do not move horizontally.
- The driving force for these waves is gravity.
- The wave's energy is transferred across the pond through the actions of water pressure.



A stone thrown into moving water

The movement of waves in flowing water

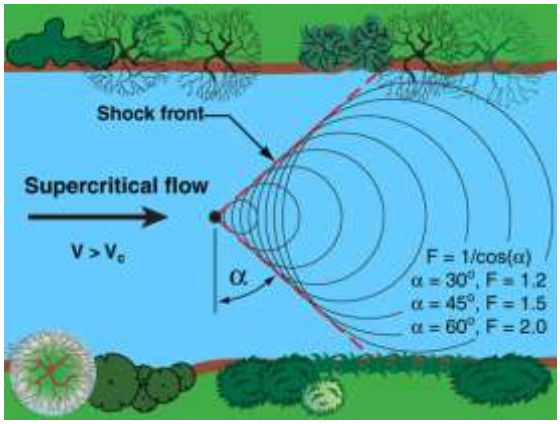
- If the same wave energy is released into a flowing river, then the wave movement will result from both:
  - the movement of the water pressure
  - the movement of the water current.
- If a rock is thrown into a flowing river, then the resulting circular waves will slowly be carried by the moving water.
- If the speed of the pressure wave is greater that the water velocity, then the wave can move upstream.



River flowing at its critical velocity

Critical velocity

- If the water velocity is equal to the speed of the pressure wave, then the wave cannot move upstream.
- If a rock is thrown into water, it causes the water surface (splash point) to first fall, then rise, then fall, then rise, etc.
- This action continues to form new waves until friction calms the water surface.
- In this case, each new wave fails to move upstream, and so a standing wave (or shock wave) is formed at the splash point.



Supercritical flow conditions

Supercritical flow

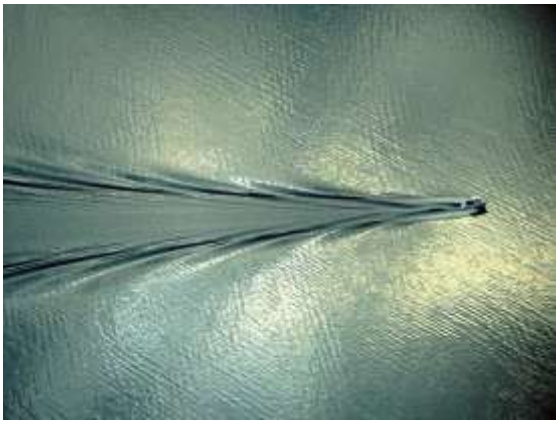
- If the water velocity is less than the wave speed, then it is called subcritical.
- If the water velocity is equal to the wave speed, then it is called critical velocity.
- If the water velocity is greater than the wave speed, it is called supercritical.
- When a disturbance occurs in supercritical flow, the resulting wave action will form an angular shock wave, which is directly related to the formation of bow waves by a fast-moving boat.

The critical velocity of fluids and the speed of causality

Sound waves

Introduction

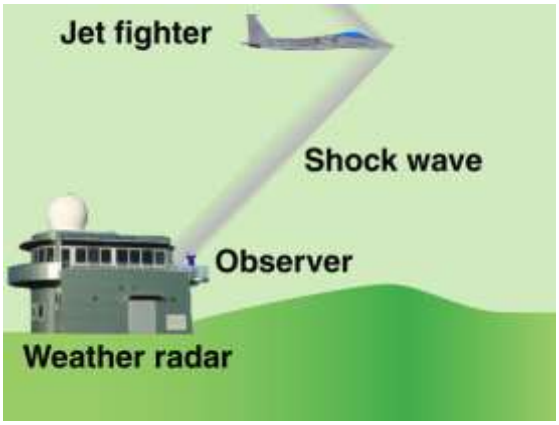
- So, from a study of sound waves, we learn that not all sound waves move at the speed of sound; instead, there is a physical reason why some sound waves achieve this maximum speed.
- From a study of water waves, we learn that when an external force is applied at the same rate as the speed of a surface wave, then a 'critical' flow condition occurs, and an abrupt shock wave is formed.



Boat wake

The speed of causality of a surface wave

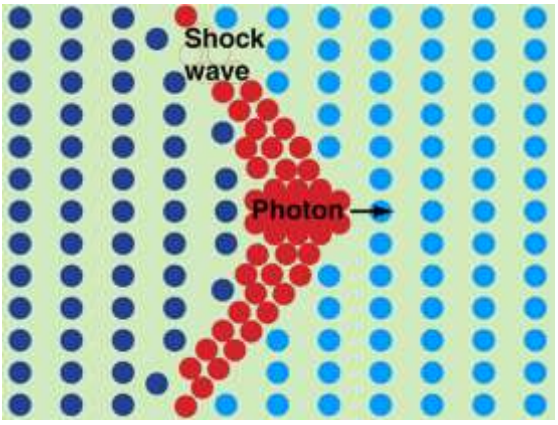
- If we can agree that the speed of causality is the speed of the force message that excites a particular action, then we should be able to agree that this speed will depend on the media, and the type of action.
- The speed of causality of a surface wave is the speed of the wave, which is called the critical velocity of water.
- The speed of causality of sound travelling through water is the speed of an internal compression wave.



A sound shock wave

The speed of causality of a shock wave in air

- Sound does not travel at the speed of sound just because it exists as 'sound'.
- There is no magic in science!
- There is a physical explanation of the mechanics that sometimes causes sound to travel at Mach 1.
- So, the speed of causality of sound in air is the speed of a shock wave in air, which could be referred to as the 'critical velocity of air movement'.

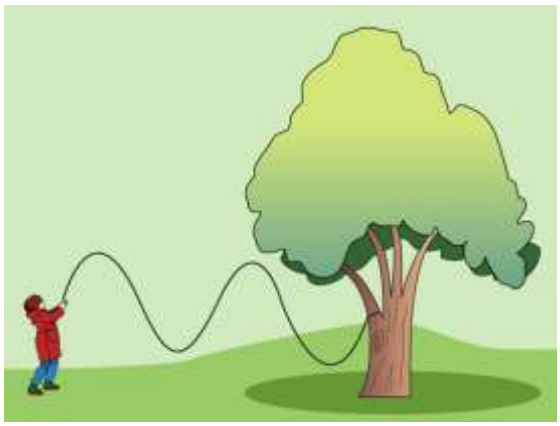


A photon its 'shock wave'

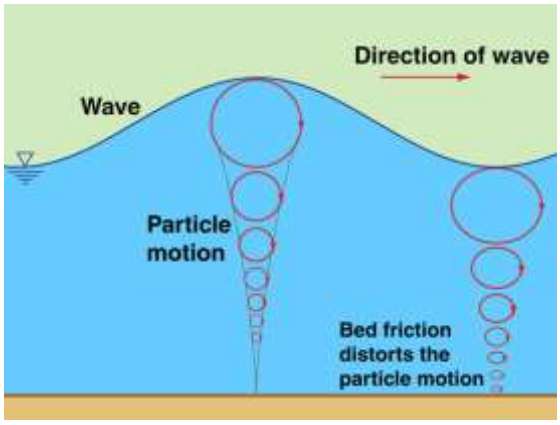
The speed of causality in space

- If something travels at the critical velocity of air, it will generate a shock wave.
- If something travels at the critical velocity of water, it will also generate a shock wave.
- Therefore, if a photon travels at the critical velocity of 'space', it seems reasonable that it would also generate a shock wave.
- But, a photon only travels as a compression wave, so would it still generate a shock wave?

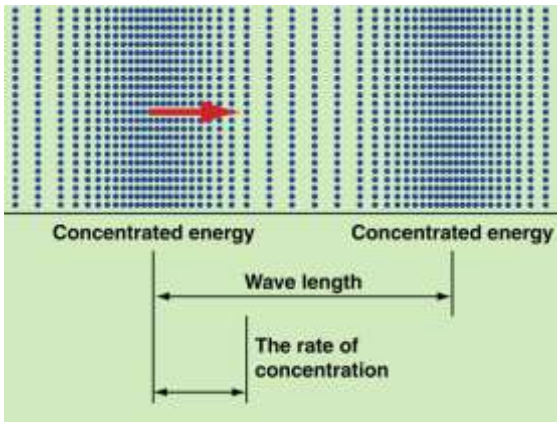
WAVE MECHANICS



Transverse waves



Wave mechanics



Energy compression waves

Surfing a coastal (broken) wave

Types of waves

- Waves are either travelling waves, or standing waters.
- Standing waves are waves that appear stationary to an observer, even though they may be moving relative to the media.
- Most waves can be classified as either energy waves or particle waves.
- Waves can be further divided into longitudinal waves and transverse waves.
- Waves can travel as a single wave, or as a set (group) of identical or mixed waves.

The properties of waves

- Waves normally involve a disturbance within a given media, or along the interface between two different forms of media (e.g. air and water).
- Energy waves involve a flow of energy, which is usually represented by 'pressure'.
- Particle waves involve a flow of matter, such as a permanent movement of water.
- The physics involved in the meeting, joining, and superposition of two waves depends on the structure of the wave.

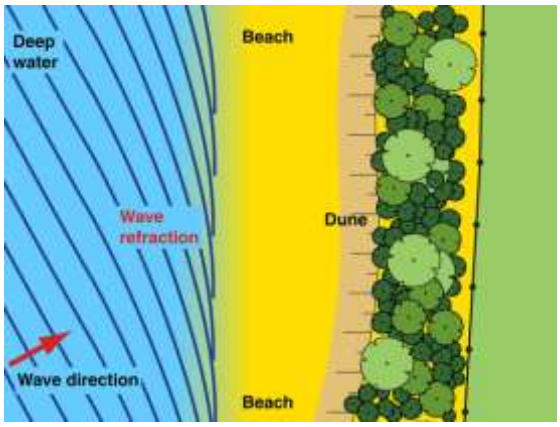
Energy waves

- Both energy waves and particle waves are examples of pressure waves.
- An energy wave transports only energy, i.e. there is no permanent movement of the physical matter.
- Examples of energy waves includes:
  - gravitational and ocean waves
  - electromagnetic waves and light.
- **Only energy waves can experience constructive and destructive interference.**

Particle waves

- A particle wave transports energy and matter.
- Examples of particle waves includes:
  - breaking (curling) coastal waves
  - tsunami waves travelling over land
  - windy weather front.
- **If two particle waves meet, they <u>will not</u> experience constructive or destructive interference.**

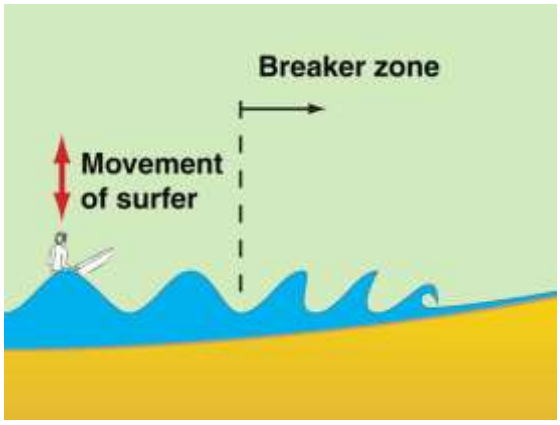
Discussion point: Ocean and coastal waves



Coastal waves

Terminology

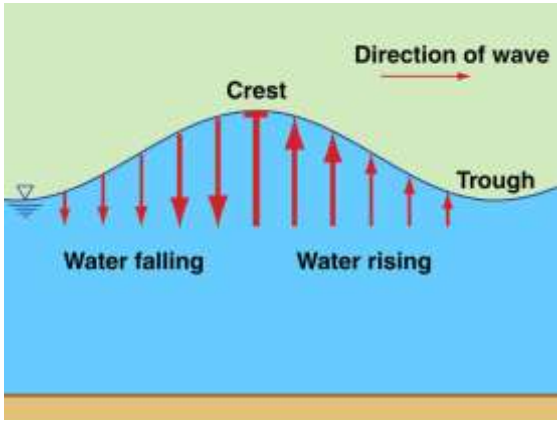
- An ocean wave is a wind-generated, non-breaking, wave that travels across deep water.
- A coastal wave is a wind-generated wave that has curled and broken due to the effects of travelling through shallow water.
- A tsunami wave is a geologically formed wave that travels at the speed of a pressure wave when passing through deep water.



Ocean wave (on the left)

Ocean waves

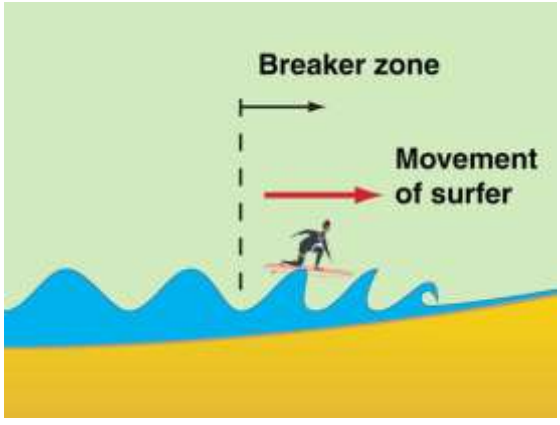
- The water contained within an ocean wave does not experience any permanent movement.
- An ocean wave only experiences virtual movement, the same as the 'pointer' on a computer screen—it just appears to move.
- The form of an ocean wave moves, and the energy moves, but not the water.
- **An ocean wave can experience both constructive and destructive interference.**



Wave mechanics

Ocean waves are transverse waves

- A transverse wave has its disturbance vectors moving perpendicular to the direction of propagation.
- It is the short-term vertical (transverse) movement of water particles that forms the profile of an ocean wave; thus, ocean waves are considered to be transverse energy waves.
- Ocean waves do not carry significant mass or momentum, but the energy flow can produce a force.

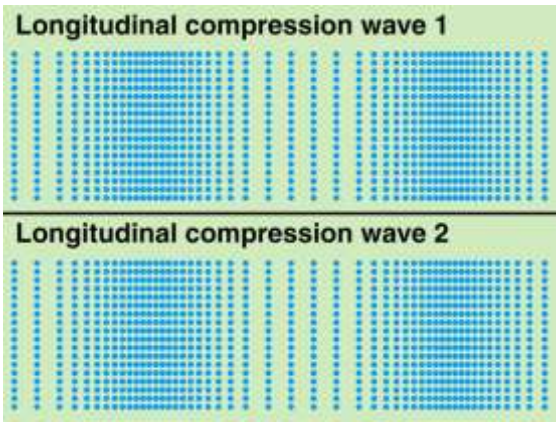


Breaker (coastal) zone (on the right)

Coastal waves are complex waves

- A longitudinal wave has its vectors aligned with the propagation direction.
- The movement and profile of a coastal breaking wave are defined by both the vertical and horizontal movement of the water particles.
- A broken wave is a particle wave that experiences physical movement.
- Broken waves have significant mass, momentum and energy flow, which a body surfer will feel from time to time.

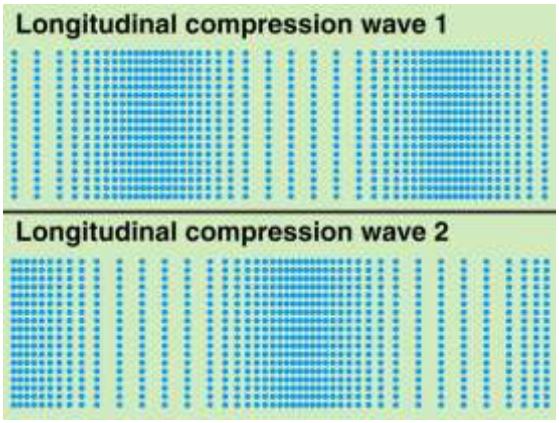
Wave interference



Two <u>constructive</u> longitudinal waves

Constructive interference

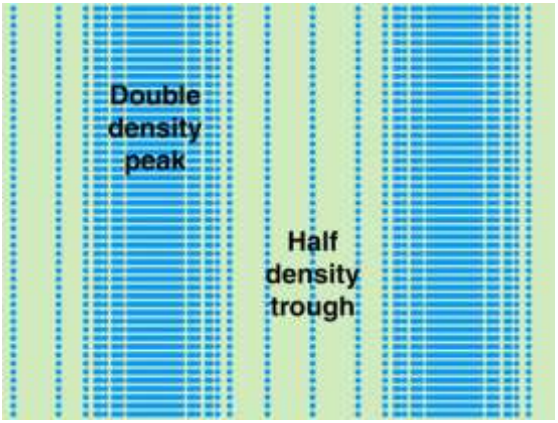
- In wave theory, constructive interference is the superposition of the 'positive' aspects of multiple waves, or the 'negative' aspects of multiple waves.
- Constructive interference is most commonly associated with the doubling of peaks and troughs when two waves meet.
- Constructive interference can occur on both merging transverse (ocean waves) and longitudinal energy waves (e.g. light).



Two <u>destructive</u> longitudinal waves

Destructive interference

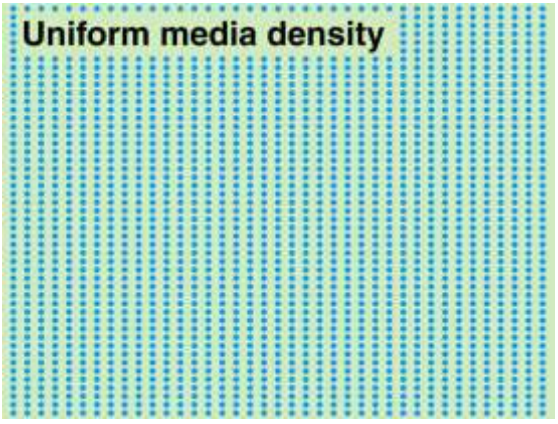
- Destructive interference is the superposition of a 'positive' aspect of one wave with a 'negative' aspect of an intersecting wave.
- Destructive interference is most commonly associated with the zero-amplitude wave produced when a <u>wave crest</u> interests with a <u>wave trough</u> of the same amplitude.
- Destructive interference can occur upon merging of two transverse energy waves, or two longitudinal energy waves.



Combining two <u>constructive</u> waves

The interference of energy waves

- Energy waves are the only waves that can cross the path of other energy waves without significant loss of energy, or a change in direction.
- Energy waves are the only waves that can readily experience constructive and destructive interference without a loss of energy, or change in direction.
- **This outcome supports the idea that a photon is an energy wave, and <u>not</u> a particle, or particle wave.**



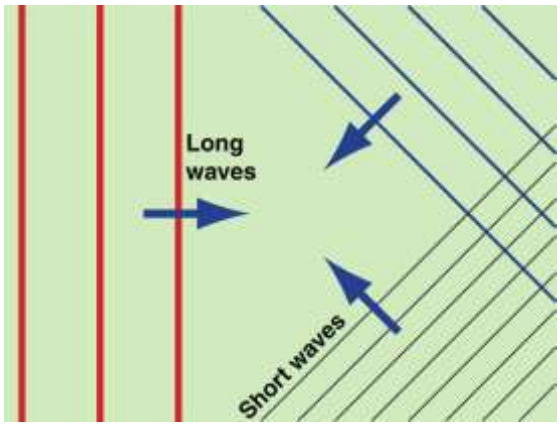
Combining two <u>destructive</u> waves

The interference of particle waves

- Particle waves can only experience constructive and destructive interference in special circumstances.
- Unlike ocean waves, broken waves do not experience constructive or destructive interference—instead, the waves experience a transfer of momentum.

The diagrams (left) are presented for demonstration purposes only. Unfortunately, the density of the blue dots is not an accurate representation of the superposition of the waves shown in the upper diagrams.

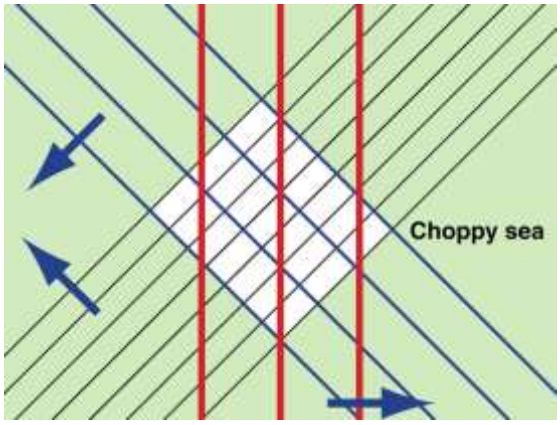
The interference of ocean waves



Tree sets of ocean waves

Deep water (ocean) waves

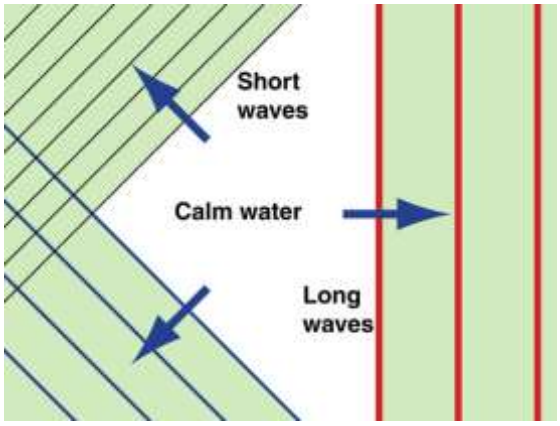
- Deep water waves can travel great distances across an ocean.
- They are able to travel such distances because they are ‘virtual’ waves (i.e. energy waves, or non-particle waves).
- This means they can move through other waves without a significant loss of energy, loss of momentum, or change in direction.
- The seas may look ‘choppy’, but experienced sailors can recognise the long waves passing through an area.



Constructive and destructive interference

Constructive and destructive interference

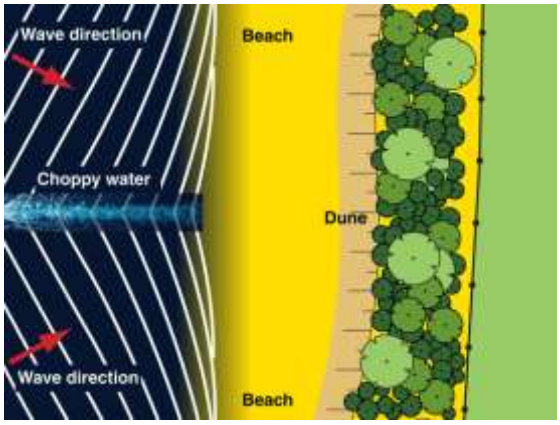
- When deep water waves meet each other, their wave energy (water pressure) can experience constructive and destructive interference, which can make the seas even more choppy.
- However, there is no transfer of momentum between these waves.



No lasting interference

No change in energy or direction

- Once the waves have left a given location, the energy and elevated water pressure have gone, and the ocean will return to calm conditions.
- As far as their movement is concerned, deep water ocean waves can be considered to be massless waves.
- **It is not the ‘mass’ of the wave that is important; instead, it is the energy, or water pressure that is important.**

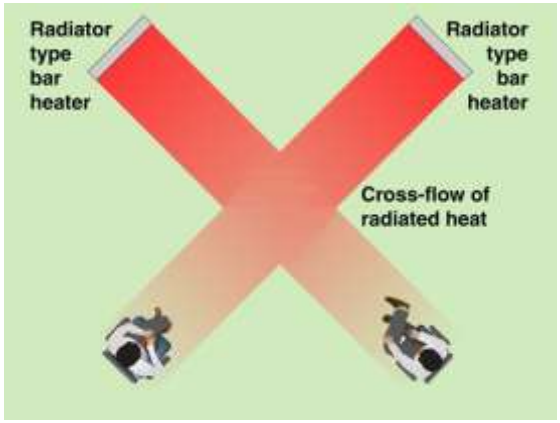


The ‘collision’ of two broken waves

Coastal (broken) waves

- Once a coastal wave breaks, and the upper waters of the wave tumble forward, the wave becomes a particle wave.
- The wave now has the ability to transfer momentum to objects that it hits.
- The mass of the wave now becomes important with respect to its total energy and power.
- **Once a coastal wave has broken, it can not pass through (i.e. superimpose) another broken wave.**

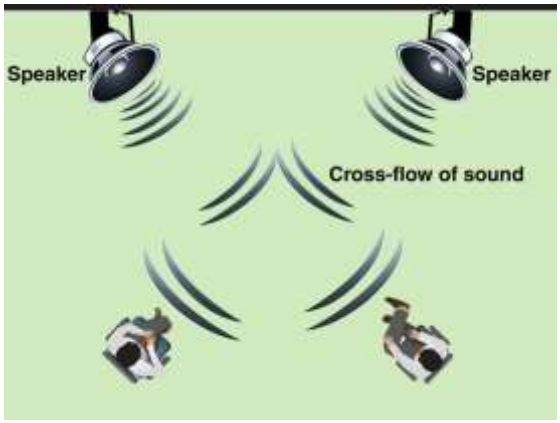
Discussion point: The mechanics of energy flow and particle flow



Two radiator heats

Two radiator-type heaters (energy flow)

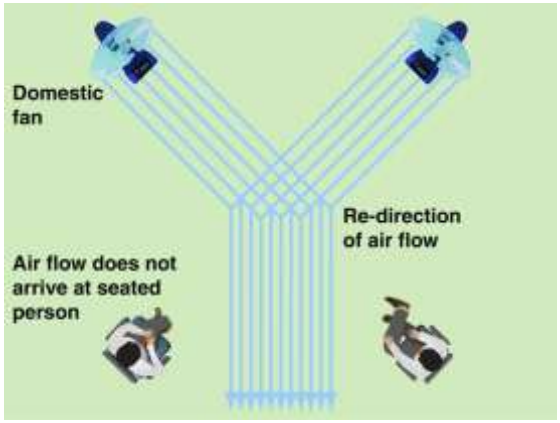
- Radiator heaters project their heat (energy) as rays, which convert to heat once the rays hit an object.
- (Fan heaters heat the air, then blow this hot air towards an object.)
- If you were to set up two radiator heaters such that the energy rays crossed paths, then there would be no loss of energy, or change in direction by the energy rays:
  - i.e. both gentlemen would continue to receive the heat directed towards them.



Cross flow of sound waves

Two sets of sound waves (energy flow)

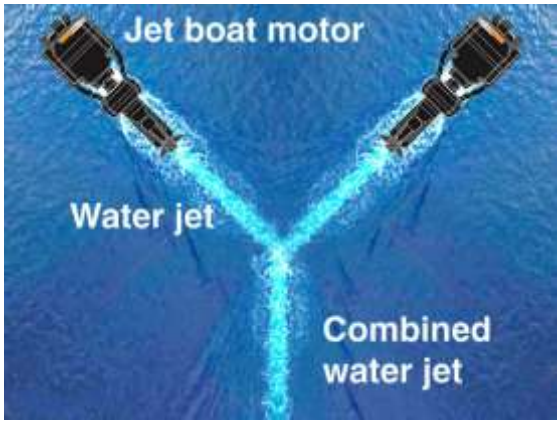
- If two sets of sound waves were to cross paths, then these two sets of waves would pass through each other with little loss of energy, or change in direction.
- In the case shown left, both gentlemen would continue to receive the sound directed towards them (but of course, some of the other sound as well).



Two jets of air

Two jets of air (particle flow)

- In the above examples, it is only energy that is moving.
- In this example (left), two streams of air (i.e. physical matter) are trying to cross the flow path of each other.
- Two streams of air flow cannot cross each other without an exchange of momentum causing a loss of energy, and/or change in the direction of their travel.
- Both gentlemen will get disturbed air flow.



Two jets of water

Two jets of water (particle flow)

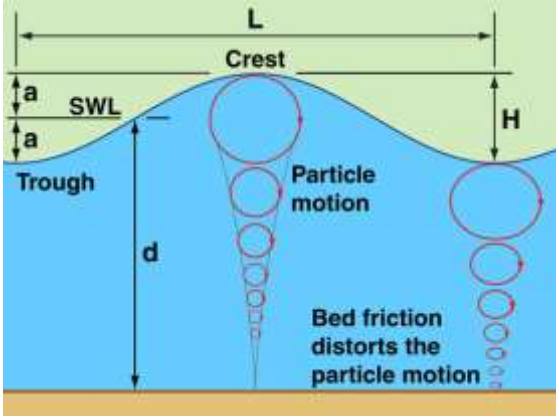
- Similarly, two jets of water cannot cross the path of each other without a loss of energy, and/or change in direction.

The lessons:

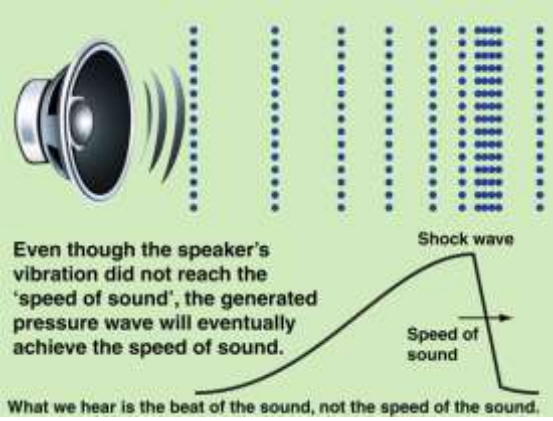
- **A flow of energy can cross the pathway of another flow of energy.**
- **A flow of matter cannot freely cross the pathway of another flow of matter.**
- **Photons are able to freely cross the pathway of other photons, so photons must represent a flow of energy.**

Lessons

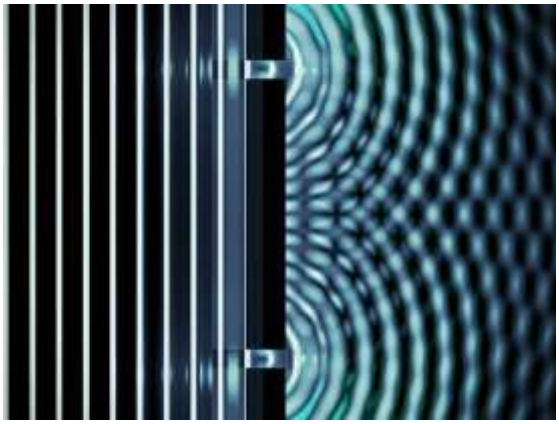
Lesson



Wave theory



Speed of sound



Double slit experiment

Introduction

- An understanding of the mechanics of wave motion can tell us that:
  - all waves do not share common properties
  - the mechanics of a wave depends on the structure of the wave
  - only energy waves can experience constructive and destructive wave interference
  - only an energy wave can pass through another energy wave, or a particle wave.

The movement of surface waves

- The movement of surface waves, such as ocean waves, is governed by gravity and the viscosity of water.
- Ocean waves are energy waves, which means that only the energy (or pressure) of the wave moves with the wave.
- The speed of a wave can be linked directly to its wave length, such that:

$$V = L/T$$

V = wave speed
L = wave length
T = wave period (depends on water viscosity)

The movement of compression waves

- The movement of compression waves is governed by the pressure gradient, and the viscosity of the fluid.
- In general, all pressure gradients try to disperse in order to achieve a uniform pressure.
- The movement of pressure gradients is similar to the transfer of heat.
- A pressure gradient achieves its maximum speed when the fluid generates an abrupt pressure front (i.e. a shock wave).

Understanding the properties of 'light'

- Light cannot travel as a 'particle' because:
  - a particle cannot travel at the speed of light
  - a particle cannot travel through another particle
  - a particle wave cannot generate constructive wave interference.
- Light travels as a compression wave, similar to sound, expect the media through which light travels is always quantum forces, even then light travels through air, water, or other substances.

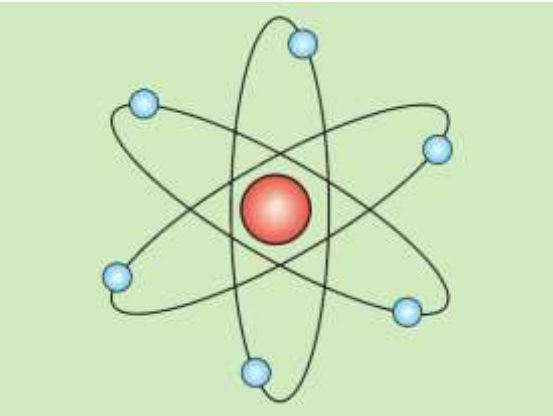
3. The Properties of Forces

Introduction

Why not!

Introduction

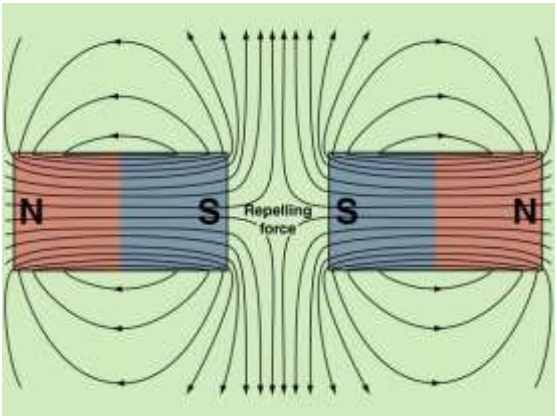
- Our current model of the universe places an emphasis on energy being the primary product of the Big Bang.
- However, we can look at things from another point of view by noting that every action that has occurred within our universe has occurred because of the actions of forces.
- So, why not consider 'forces' as being the primary product of the Big Bang.



Atomic activity

Fundamental interactions

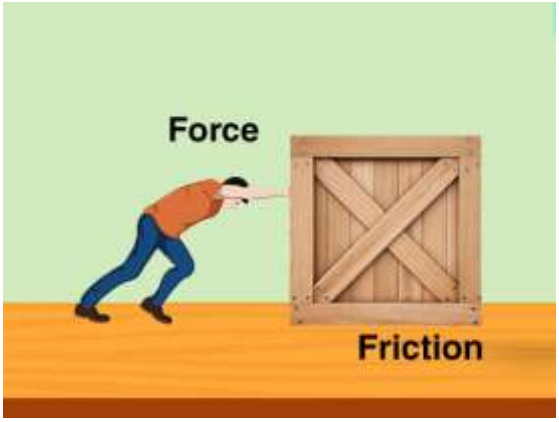
- Our current energy-based model of the universe has brought as to a position of accepting that there are four fundamental interactions within the universe, those actions being:
  - gravity
  - electromagnetism
  - weak interaction, and the
  - strong interaction.
- A force-based model of the universe can show us the link between the forces.



Repelling magnetic force

The force of magnetism

- Consider the forces involved in magnetism, specifically, the forces that exist between two magnets of the same polarity.
- The force that exits in this space:
  - is a repelling force, and
  - can exist in a vacuum, and
  - it has no set dimensions; however, the force does decrease with an increase in the distance of separation.

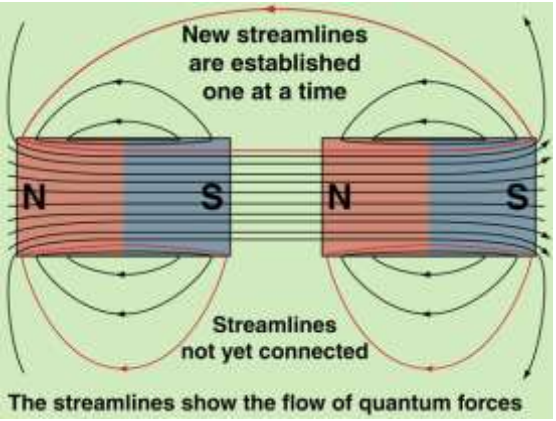


A repelling or pushing force

The assumed properties of forces

- In this paper I have assumed the following properties of all forces:
  - all forces are repelling forces
  - a force cannot be an 'attracting' force, nor an 'action at a distance'
  - all forces originate from quantum forces as the sole product of the Big Bang
  - all forces are dimensionless, and without physical substance
  - every aspect of the universe was formed from the actions of forces.

Understanding the properties of forces



Attraction of two magnets

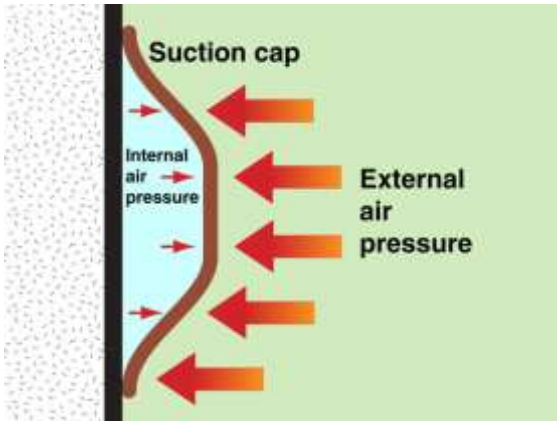
All forces are repelling forces

- Currently, science accepts that forces can be both ‘repelling’ and ‘attracting’.
- However, my position is that all forces must be repelling forces.
- This means that the ‘apparent’ attracting force between the positive and negative poles of two magnets must be able to be explained in terms of only repelling forces.
- This also means that the forces associated with a vehicle toe rope can be explained in terms of repelling forces.

Vehicle toe rope

The internal forces of a ‘toe rope’

- According to our current theory of atomic activity, atoms do not have direct contact with each other.
- We assume that two atoms are able to repel each other, but what action exists that binds the atoms of a vehicle toe rope together?
- The answer is the sharing of electrons.
- Therefore, the proof that a toe rope functions only through repelling forces rests in our understanding of atoms.



Suction cap

All pressures are positive pressures

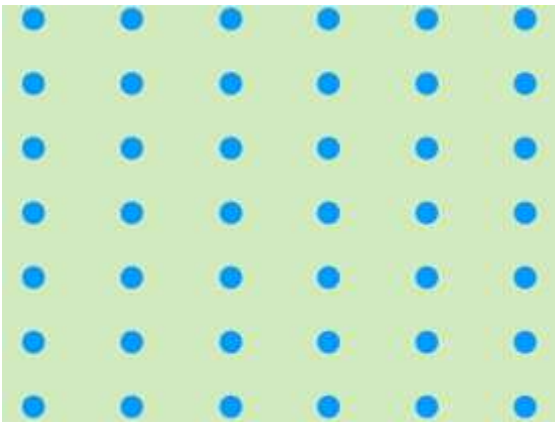
- Does a suction cap use suction?
- A suction cap works because the positive pressure on the outside of the suction cap is greater than the positive pressure that exists inside the suction cap.
- A race car with ‘ground effects’ is not sucked onto the racetrack, but instead is pushed down onto the racetrack.
- All pressures are positive pressures—there is no such thing as a true suction.

Gravity

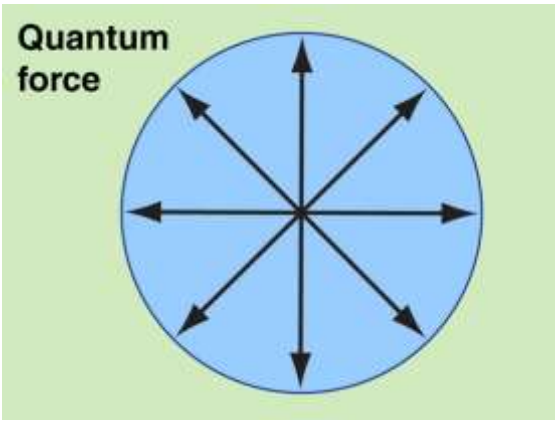
No ‘actions at a distance’

- Can a force act at a distance?
- Every action has a logical explanation; it is just unfortunate that we do not currently have the knowledge to explain the logic of all of our observations.
- It is only the arrogance of some people that takes us down a path of suggesting magical outcomes can occur.
- It is my belief that every action at a distance will eventually be explained with little more that high school physics.

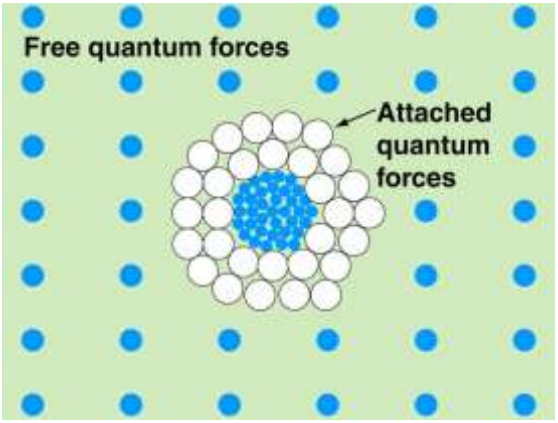
An introduction to quantum forces



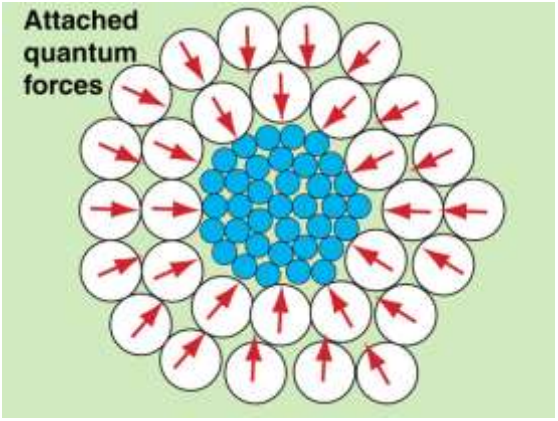
Non-concentrated (free) quantum forces



Region of influence of a quantum force



Different states of quantum forces



Concentration of quantum forces

Introduction

- In this paper, the term: 'quantum force' has been adopted to describe the primary product of the Big Bang.
- The term: 'quantum force', has nothing to do with the current science of quantum mechanics; however, quantum mechanics could be used to describe the actions of quantum forces.
- The term is simply being used as an alternative to the terms: 'energy' and 'aether'.

The assumed properties of quantum forces

- The assumed properties of quantum forces are:
  - dimensionless, but acts within a three-dimensional region of influence
  - has no physical existence
  - an infinite amount of quantum forces can exist within a singularity
  - acts only as a repelling force
  - resists moving freely, while in a non-concentrated form, through a field of free quantum forces.

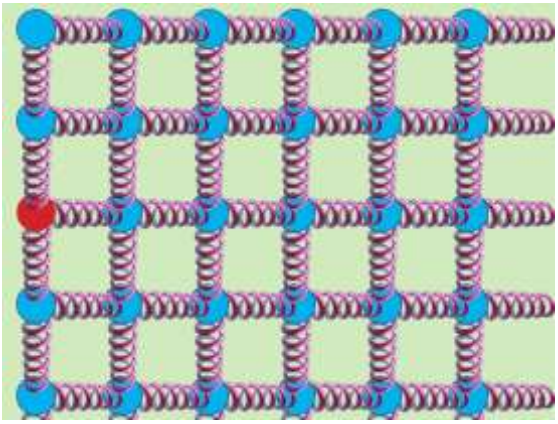
The states of existence of quantum forces

- It is assumed that quantum forces can exist in the following states:
  - free state, as would have existed in the initial period after the Big Bang, and which makes-up the majority of deep space, and therefore, 'dark matter'
  - attached state, which are the quantum forces that surround, and move with, all physical matter
  - highly concentrated state, which forms physical matter.

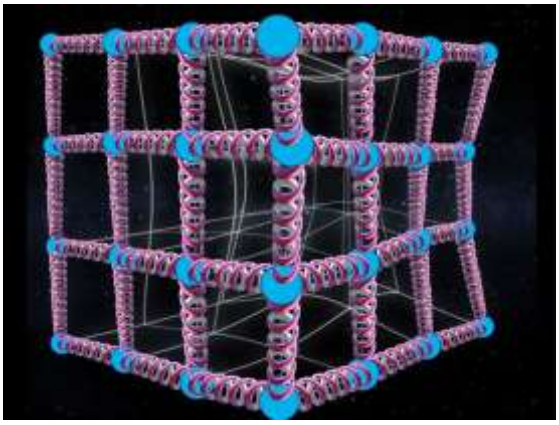
The stability of a concentration of quantum forces

- Even though a quantum force fundamentally wants to repel other quantum forces, if a concentration of quantum forces does occur, then
  - the collective forces acting inward towards the centre of this concentration exceeds the internal forces that wish to expand the concentration
  - this inwardly-acting, three-dimensional force is the force of gravity.

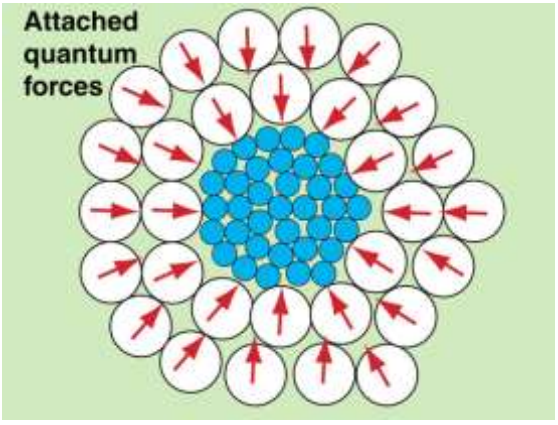
Quantum forces



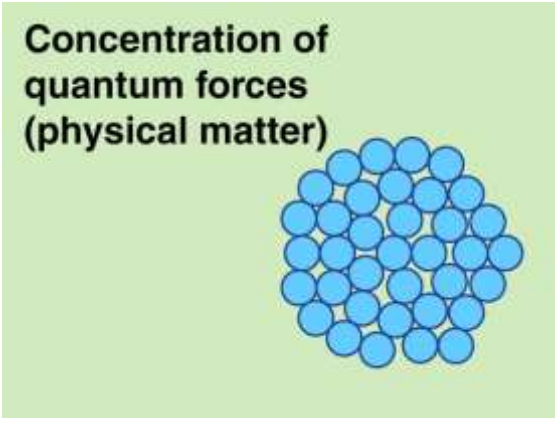
A 2D grid of free quantum forces



A 3D grid of free quantum forces



Attached quantum forces



Matter

Introduction

- In the author's opinion, the benefit of the quantum force model of 'space' is that it guides us towards conclusions that would not be realised if 'space' were considered to be filled with energy or aether.
- However, the fact is, every outcome and every conclusion presented within this paper could have been developed from an energy-based model of the universe.
- What matters is the physics, not the terminology—you can call this 'force' whatever you like.

Free quantum forces

- The properties of a free quantum force are considered to be:
  - they exist in a uniformly-spaced, three-dimensional grid
  - they have the one action of repelling all other quantum forces, which allows the force to occupy a region of influence
  - the force of repulsion is assumed to be linked to the gravitational equation
  - this repulsion force caused/causes the expansion of the universe.

Attached quantum forces

- The properties of an attached quantum force are considered to be:
  - due to the three-dimensional property of 'space', and the dimensional property of the gravitational equation, if an increased concentration of quantum forces occurs, then the surrounding quantum forces will compress and stabilise this concentration
  - the quantum forces that surround matter, push inward with such force that they become attached to the matter.

Matter

- A force-based model guides us towards an understanding of matter, mass, dark matter, electricity, magnetism, and heat.
- In the force-based model of our universe, matter is considered to be a concentration of quantum forces.
- As will be discussed in Chapter 7, quantum forces have the property of mass due to the effects of the speed of causality, and how this property is able to control the movement of a force message across the 'region of influence'.

The properties of quantum forces

Dark matter

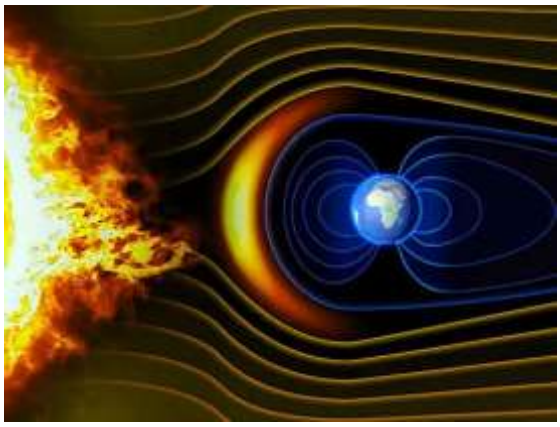
Dark matter

- Because everything in the universe is formed from quantum forces, what forms physical matter also forms magnetism, electricity and deep space.
- Collectively, the total of all free and attached quantum forces makes-up the total mass of dark matter.
- In order for physical matter to be stable, the total mass of attached dark matter must greatly exceed the total mass of physical matter.

Electricity

Electricity

- Electricity is generated by the flow of matter, or the flow of concentrated quantum forces.
- Only when this flow is at the speed of electrons does this action become detectable as electricity.
- Because all matter is surrounded by attached quantum force, the flow of electricity also generates the flow of magnetism (i.e. a magnetic field).



Earth's magnetic field

Magnetism

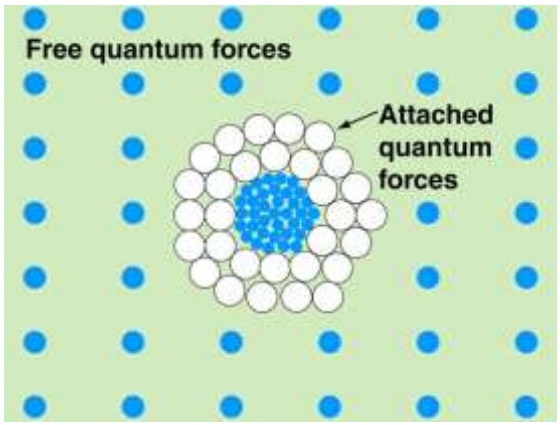
- The force we refer to as magnetism, is generated by the flow of free or attached quantum forces.
- Even though these quantum forces are classified within this paper as being 'attached', they can detach from the physical matter, and can induce the movement of free quantum forces.
- The quantum forces that make-up Earth's magnetic field can repel other quantum forces, such as solar winds.

Heat

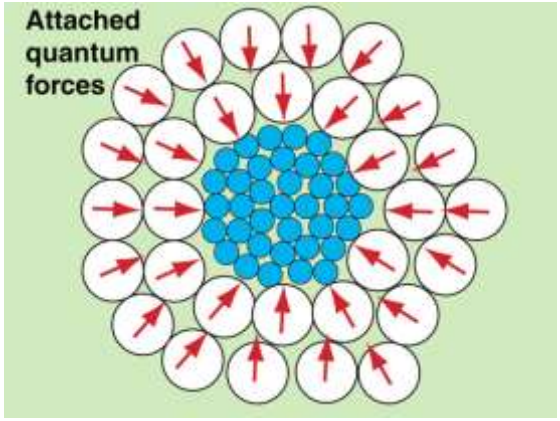
Heat

- The property that we refer to as heat is actually a measure of the concentration of free and attached quantum forces.
- As the universe expands, the concentration of quantum forces in deep space reduces, resulting in a heat reduction across the universe.
- The concept of 'heat transfer' is actually the flow of quantum forces from one concentration to another—the mechanics is similar to the transfer of air pressure (refer to Chapter 13).

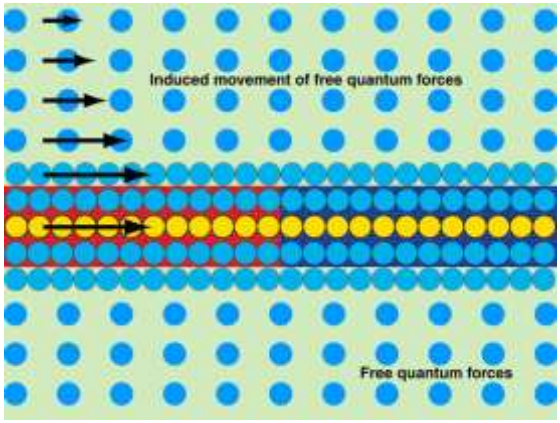
The movement of quantum forces



Free and attached quantum forces



Quantum forces attached to matter



Induced movement of free Qforces

Burnt wiring of an electric motor

Introduction

- If we can accept that the substance that fills 'space' has the single, or dominant, property of repulsion, and we choose to call this substance 'quantum forces', then it should follow that this repelling action:
  - causes the expansion of the universe
  - prevents the free movement of 'free' quantum forces (which allows temperature stratification to occur)
  - is able to stabilise a concentration of quantum forces, which forms matter
  - causes quantum forces to becomes firmly attached to matter
  - causes 'free' quantum forces to have a loose attachment to matter
  - induces a flow of 'attached' quantum forces when matter moves
  - induces a flow of 'free' quantum forces when 'attached' quantum forces move
  - allows 'attached' quantum forces to move through 'space' when attached to matter
  - allows the disturbance of 'free' quantum forces caused by the movement of matter through 'space'.

The movement of electricity

- As previously mentioned, electricity is generated by the flow of matter, specifically the flow of electrons.
- This flow of electrons generates a similar movement of attached quantum forces, which generates a magnetic field.
- If the magnetic field is able to move freely, then there is no restriction or holding-back of the quantum forces, which means the density (and therefore the heat) of the attached quantum forces remains unchanged.

A resistance to the flow of electricity

- If an electrical wire has minimal resistance, then there will be unrestricted movement of the attached quantum forces, and no heat build-up.
- If the electrical wire has a level of resistance, then the flow of attached quantum forces will 'pump' quantum forces into the wire, and as a result, will increase the density of free and attached quantum forces within the wire, which will result in an increase in the temperature of the wire.

Lessons

‘Forces’ have no physical existence

- At a human scale, we see physical objects exerting a force on other physical objects, but at an atomic level we accept that there is never any direct matter-to-matter contact.
- There is always a degree of separation.
- All forces extend across a region of ‘empty’ space, but this space is not really empty.
- All ‘forces’ have no physical existence.

‘Space’ is not empty

- The movement of gravitational waves confirms that ‘space’ does not contain regions of empty space.
- ‘Space’ exists as a continuum because space was created by the expansion of a medium, which this author has chosen to call; ‘quantum forces’.
- ‘Space’ behaves like a superfluid, which is a fluid that exhibits frictionless properties, unless an object’s velocity approaches the speed of light.

The universe exists in three states

- The universe is filled with only quantum forces, which can exist in three states:
  - free quantum forces, which form the bulk of deep space, and dark matter
  - attached quantum forces, which push inward against physical matter with such force that they become attached, surround, and travel with, the physical matter
  - concentrated quantum forces, which form physical matter.

Electricity, magnetism and heat

- The movement of physical matter generates electricity.
- The movement of free or attached quantum forces generated magnetism.
- The sensation of heat is generated by the density of free or attached quantum forces.
- As the universe expands, the background level of heat declines.

4. The Theory of Nothing

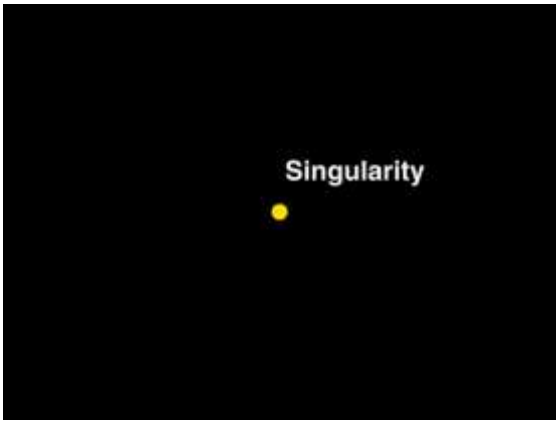
Introduction

Questions

Introduction

- If I were to guess what are the most popular questions about astrophysics, they would be:
  1. Are there aliens?
  2. Is time travel possible?
  3. Is there a god?
  4. What existed before the Big Bang?
- It is the latter question that interests me.

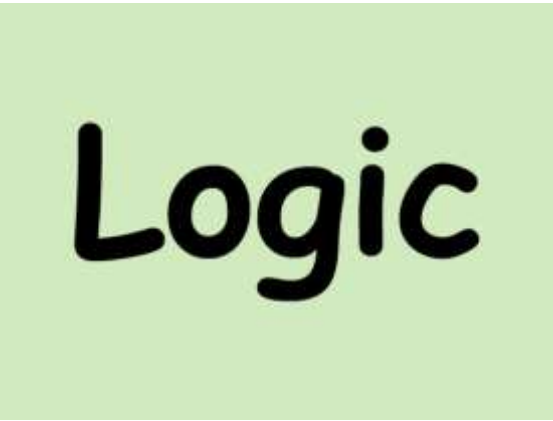
How was it possible for our vast universe to have been formed from ‘nothing’?



Singularity

The impossible concept of a singularity

- The idea that, all the physical matter that makes-up the universe, once existed as a singularity that had no dimensions, is a concept that just seems impossible.
- However, if we can accept that everything in the universe is formed from forces, and we can accept that forces have no physical existence or dimensions, then a singularity would seem possible.
- But that still requires us to accept that all physical matter is, and was, formed from something that had no physical matter.



Logic

What logic would tell us

- Logic tells us that if nothing existed before the Big Bang, then nothing must exist after the Big Bang.
- This suggests that the physical matter we experience day-to-day, does not really exist.
- This is the ‘Theory of Nothing’.

Cake store

Why do YOU think that the cake that you are eating, exists as physical matter?

- We trust that matter exists because:
  - we see the cake
  - we smell the cake
  - we hear us unwrap the cake
  - we taste the cake
  - we feel the cake in our hand.
- Our five senses tell us that physical matter exists, but what is it that is feeding our five senses this information?

Our five senses

Professor

Our five senses

- Our perception of physical matter is based on our five senses:
  - we see matter
  - we hear matter
  - we smell matter
  - we taste matter
  - we touch and move matter.

These five senses are all produced by forces, which ultimately are generated by quantum forces, which have no physical existence, thus matter has no physical existence.

Human eye

Light

- The sensation of light is **only** produced within the minds of living creatures.
- Light becomes visible to humans because photons are capable of causing physical excitation within all molecules, which leads to changes in the chemistry within the visual molecule retinal of the eye.
- 'Light' is our mind's interpretation of a force.

Therefore, the universe actually exists in total darkness.

Human ear

Sound

- The sensation of sound is **only** produced within the minds of living creatures.
- A falling tree produces only fluctuations in air pressure, which are detected by our ears, which sends an electrical signal to our brain, and only then is a sound created.
- There was no Big BANG, just a big expansion!

Therefore, the universe actually exists in total silence.

Human nose

Smell

- The sensation of smell is **only** produced within the minds of living creatures.
- Gases with a chemical composition that can be registered by receptors within the nasal cavity, cause an electrical message to be sent to the brain, which creates the sensation of either a good or bad odour.
- The answer to the question: *Who made that smell?* is always, YOU!

Therefore, the universe exists without odours.

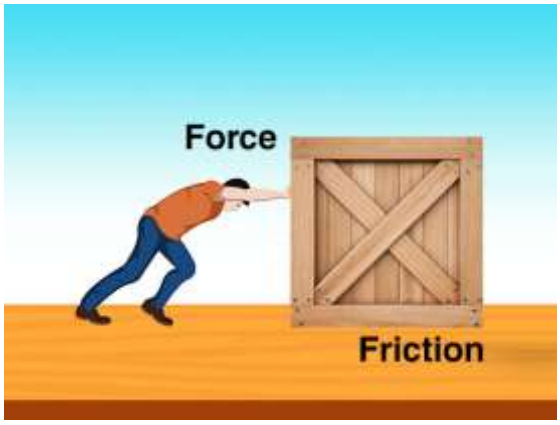
Our five senses

Spices

Taste

- The sensation of taste is **only** produced within the minds of living creatures.
- Taste is the perception produced when a substance in the mouth reacts chemically with taste receptor cells located on taste buds in the oral cavity, mostly on the tongue.
- Humans can detect five taste modalities: sweetness, sourness, saltiness, bitterness, and savouriness.

Therefore, the universe exists without taste.



A repelling or pushing force

Touch

- Objects that we have traditionally referred to as 'matter' cannot touch each other at a molecular level—it is believed that molecular repulsion prevents any direct contact from occurring.
- This means that you have never actually touched any physical matter.
- The sensation of touch is generated by repelling forces, which can cause a deflection in the touched and/or touching surface, but it is the brain that registers this feeling.

Lava

Heat

- Heat is a measure of the density of quantum forces (Chapter 12).
- The sensation of heat is caused by our body's ability to register a change in the density of quantum forces.
- Ultimately, heat is product of quantum forces, which are made-up of 'nothing' physical.

The feeling of heat is created in the brain, while the action of heat is solely a product of forces.

Conclusion

In conclusion

- So, our five senses are generated by forces—the same forces that generated the Big Bang, and the same forces that have no physical existence, which means our five senses simply create an illusion.
- But you say: *We can also use physics to determine the mass of objects, including planets, stars, and the whole universe.*
- Well again, quantum forces generate the illusion of mass through the actions of the speed of causality—so still, there is nothing!

Is there a place for a ‘god’ in the science of the universe?

The question

Introduction

- So, if nothing physically exists in the universe, then nothing needed to be created, except of course, the original singularity of quantum forces.
- So, does this mean that there was no creator of the universe? Well, no!
- The quantum force model of the universe neither proves, nor disproves, the existence of a ‘god’.

God and quantum forces

God and quantum forces

- The quantum force model of the universe demonstrates that the entire universe exists only through the actions of forces, which means it could exist solely within the imagination of a greater being.
- Through the quantum force model of the universe a person can choose to believe that the universe was created:
  - in five days, or
  - by evolution, or
  - through the actions of a dreamtime.

The creation of false idols

The creation of false idols

- The quantum force model of the universe demonstrates that all the Earthly representations of a ‘god’ are just illusions generated by forces, which could have ultimately been created by a heavenly being.
- The quantum force model of the universe tells us that there is no religion that can be dismissed as ‘false’, unless that religion is based on the worship of an Earthly person or object (i.e. a false prophet).

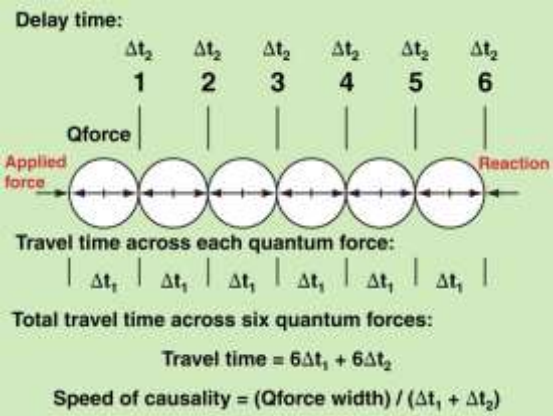
A false prophet

Recognising a false prophet

- In my opinion, a false prophet is someone that professes that they can **prove** the existence of a heavenly god.
- Religions are based on a belief, and a ‘belief system’ is based on the idea that the belief cannot be proven.
- Anyone that suggests that they can **prove** such a belief, or speak to such a god, is someone acting outside that belief; in other words, they are acting as a false prophet.

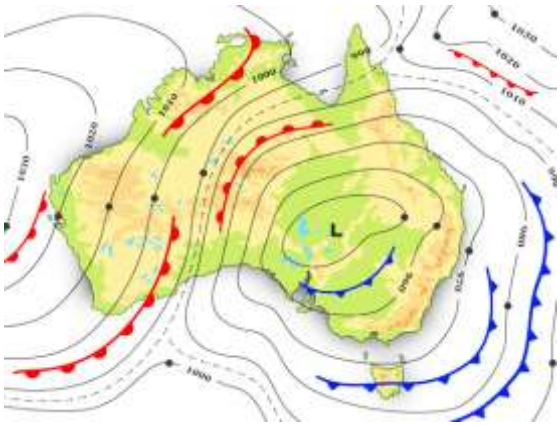
5. The Speed of Causality

Introduction



Speed of causality

Vibrating sound speaker



Weather front

Speed detection

Introduction

- The term: 'speed of causality' can have a variety of means depending on the 'action' that is occurring.
- It is really the speed of a force message (or an energy message if you prefer).
- It is a measure of how quickly a force message can travel through our universe.
- This force message can involve the movement of light, the movement of sound, or the movement of a fluid.

The speed of sound

- The speed of sound is the speed of causality of the media through which the sound travels, such as 'air'.
- When a sound speaker vibrates, it causes the air adjacent to the speaker to vibrate; however, this vibration, or movement, does not occur at the speed of sound.
- These vibrations of air particles create compression waves in the air, and it is the force of compression that ultimately moves at the speed of sound.

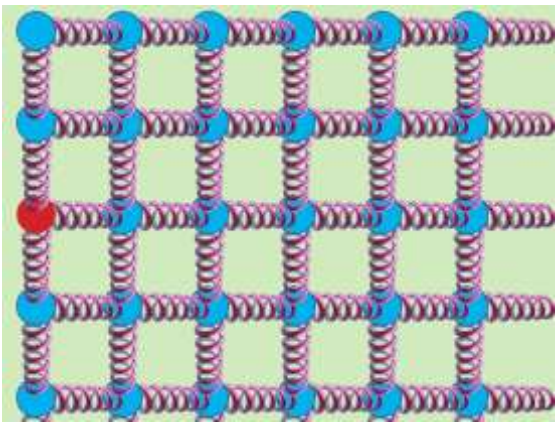
An energy wave travels at the speed of causality for a given media

- An energy wave travels at the speed of causality of the media through which it travels.
- A particle wave, however, travels at the speed of the particles, which depends on the speed of the initial action.
- For example, a sound wave can travel at the speed of sound, while a weather front, which is also a pressure wave, travels at a much slower speed.

The speed of light

- The speed of light is the speed of causality of the media through which the light travels, which could be deep space, air, water or glass.
- This means that the speed of light is not a constant, but actually depends on (i) the velocity of the media, and (ii) the density of the media.
- Thus, the speed of light on Earth is affected by the speed of Earth through space, and Earth's magnetic field, which travels with the Earth.

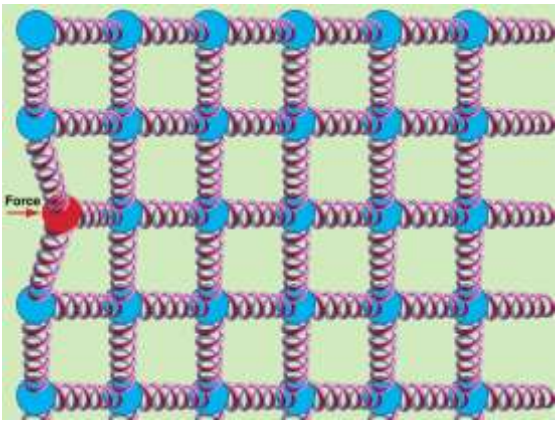
The speed of causality



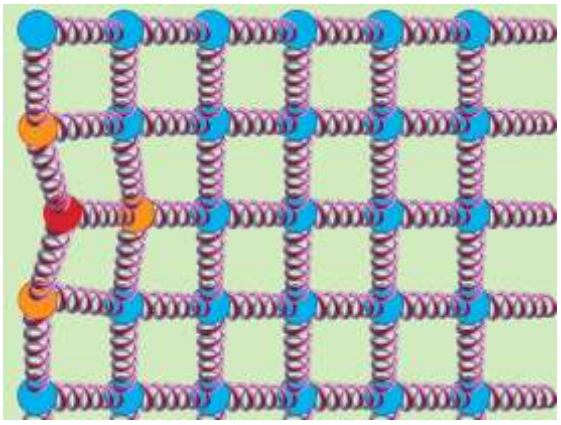
Energy field at rest

The speed of causality

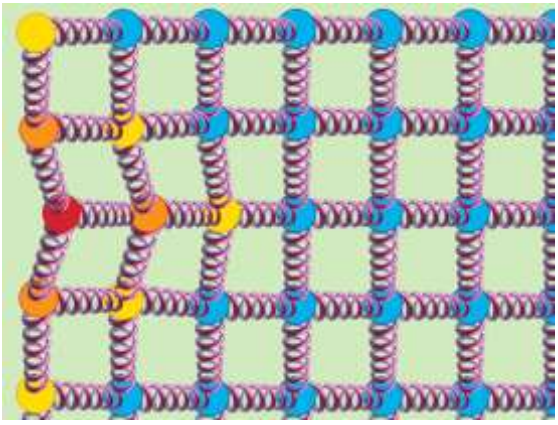
- Imagine a field of free quantum forces (i.e. deep space) separated by springs, which act as the repelling forces.
- If you apply a force to one quantum force, then the speed of causality is the speed that this force message travels:
  - through an individual quantum force (i.e. the rate of compression of one spring), plus
  - from one quantum force to the next.



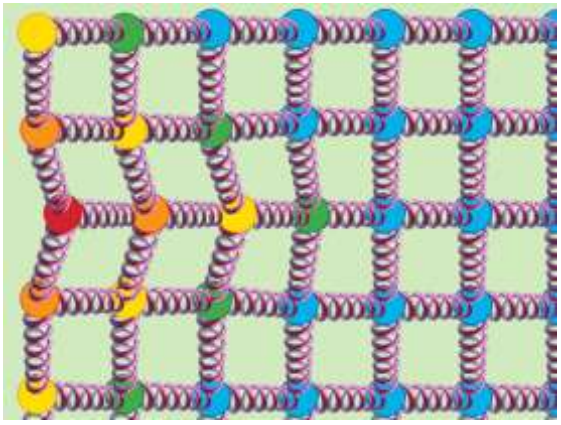
Force applied (t = zero)



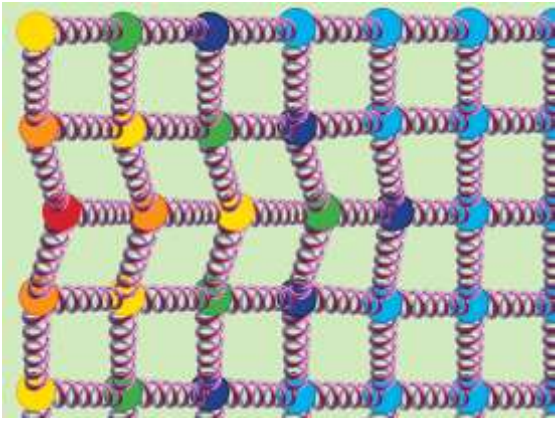
Time = Δt



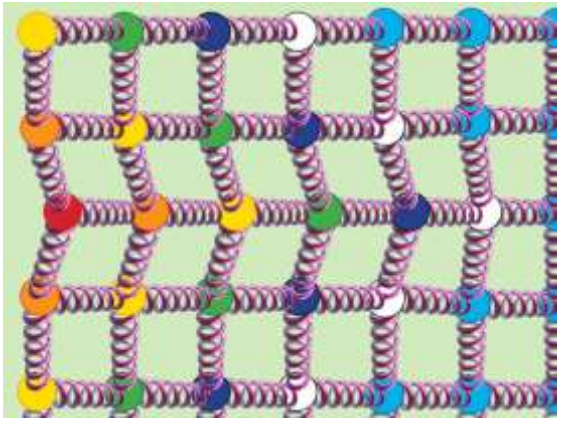
Time = 2Δt



Time = 3Δt



Time = 4Δt



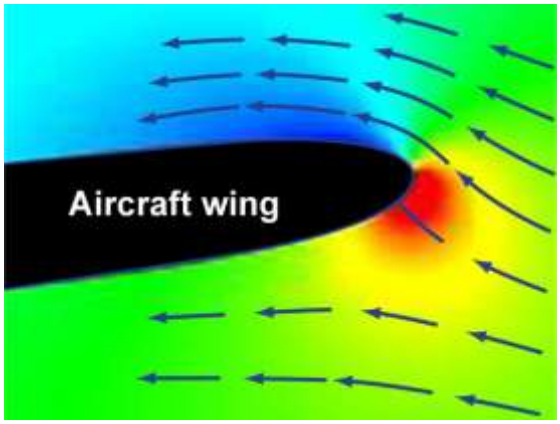
The action of a compression wave

The concept of ‘critical velocity’

Water motion linked to critical velocity

Critical velocity in water flow

- The critical velocity of a fluid is the speed that an energy message, or a pressure wave (the same thing), can move through the fluid.
- In hydraulics, critical velocity is similar to the term speed of causality.
- The difference in how the terms are used is that a physical object can move through a fluid at speeds greater than the fluid’s critical velocity, but a pressure wave cannot move faster than the critical velocity.



Subsonic air flow

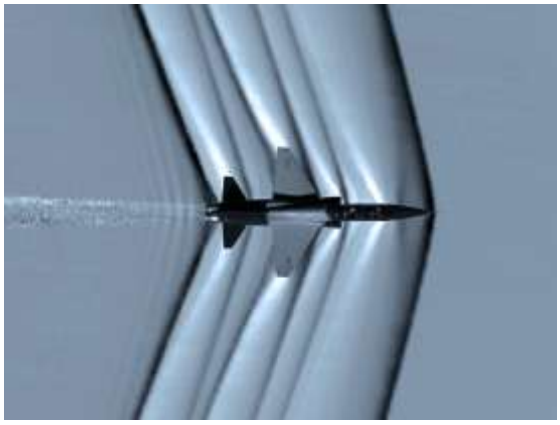
Moving slower than the critical velocity

- If a physical object moves through a fluid at a velocity that is lower than the fluid’s critical velocity, then the pressure wave created by this movement is able to move faster than the object.
- This means that fluid particles just ahead of the object will receive a pressure message telling them that something is moving towards them, which allows fluid particles to start moving out of the way of the approaching object before it arrives.

Subsonic aircraft

Subsonic flight

- Even though a commercial jet travels at a very high speed, this speed is less than the critical velocity of the air.
- This means that the air just ahead of the aircraft will receive a pressure message telling it to start moving out of the way of the approaching aircraft.
- This means that subsonic aircraft can have a rather abrupt, but rounded nose, and still be ‘streamline’ (aerodynamic).



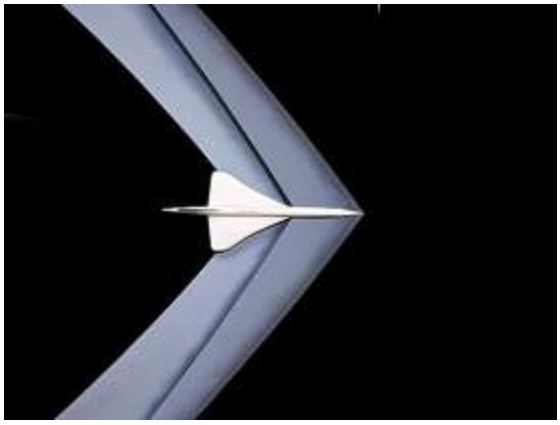
Supersonic flight and shock wave

Supersonic flight

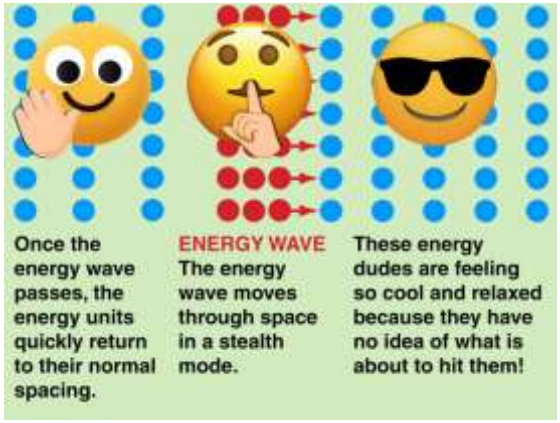
- However, if a plane travels through air at a speed greater than the critical velocity of the air (i.e. supersonic), then the air just ahead of the aircraft will NOT receive a pressure message telling it to get out of the way.
- The sudden arrival of the jet will come as a ‘shock’ to the air particles.
- This action creates a shock wave, which is caused by the compression of the air, and its subsequent rapid movement.

The speed of causality

Speed boat wake



Sound-based shock wave



Energy wave in 'space'

Light

Understanding the speed of causality

- In fluid mechanics, the speed of causality is better known as the 'critical velocity' of a fluid.

In water:

- If water is the fluid of interest, then the speed of causality is defined by the speed of a surface wave.
- If an object moves over the surface of water at a speed that is less than the speed of a surface wave, then this object is said to be travelling at a subcritical velocity.
- If an object is travelling faster than the speed of a surface wave, then the object is said to be travelling at a supercritical velocity.

In air:

- If air is the fluid of interest, then the speed of causality is defined by the speed of sound (Mach 1).
- If an object is travelling slower than the speed of sound, then the object is said to be travelling at a subsonic velocity.
- If an object is travelling faster than the speed of sound, then the object is said to be travelling at a supersonic velocity.

In deep space:

- If space is the fluid of interest, then the speed of causality is defined by the speed of light.
- In this case, it is not an object of matter that is travelling through a fluid, but the movement of a force message, or energy wave.
- When light travels through space, it travels as a shock wave, which experiences similar mechanics to a sound wave travelling through air, water, or other fluid.

The speed of causality is not a constant

- The speed of light is not a magical value, or even a constant (sorry Einstein).
- The speed of light is governed by the speed of causality, which depends on the substance through which it travels.
- The speed of causality depends on the speed of a force message across the region of influence of a quantum force, plus the time delay crossing the boundary between two quantum forces, causing the speed to be controlled by the density of quantum forces.

Lessons

The speed of a force message

- Our universe was created through a series of ‘actions’ that were generated by ‘forces’.
- These forces travel across the universe as force messages, which obey the laws of physics.
- The speed of these force messages is defined as the speed of causality.

A force message takes time to cross a quantum force, and to jump between quantum forces

- Newton’s third law of motion tells us that when one body exerts a force on a second body, the second body exerts an equal and opposite (opposite in direction) force on the first body.
- What Newton’s third law of motion does not tell us is what type of time delay exists between the application of the initial force, and the creation of an opposing force.

No action can occur until a force message arrives

- When we analyse events like the Big Bang, and the acceleration of a quantum force, we need to remember that no action will occur until a force message arrives.
- If a force message takes time to travel any distance, then there will be variations in how ‘space’ responds to these forces.
- In an Olympic race, speakers are placed close to each starting position so that each athlete gets the ‘starting’ message at the same time.

Actions that travel at the speed of a force message will generate a shock wave

- If a force message actions a form of movement, and if that force message moves at the speed of causality, then that movement will come as a ‘shock’ to anything that positioned just in front of that force message.
- Any action of movement within a fluid, that travels at the speed of causality, will generate a shock wave within that fluid, that will travel with the movement.

6. The Origin of Time

Introduction

Consider the following

Clock time

Space

Time does not exist the way you think

Introduction

- 'Time' is considered by many to be the fourth dimension because it is considered to be a necessary aspect of the identification of the location and timing of an event.
- However, 'time' can be replaced with the spatial location of the Earth, because the Earth will be at any given location only once in the history of the universe.
- Therefore, 'time' can theoretically be replaced by a set of spatial coordinates.

Clock time

- Clock time is simply a measure of the rate of movement of a specified object:
  - the movement of the Sun
  - the movement of sand
  - the gravitational or electrical movement of gears and weights in a clock.
- Clocks don't measure universal time, they only measure the rate of movement of specific objects, which we humans use as a measure of universal time.

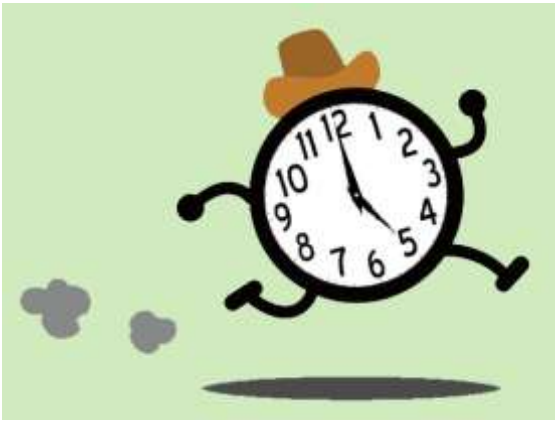
Universal time

- Within this paper, any reference to 'time' shall mean 'universal time', not clock time.
- Clock time shall always be referred to as 'clock time'.
- I assume that most people believe that time existed before the Big Bang.
- I also assume that most people believe that time is linked to velocity, and that time stops at the speed of light, and within a black hole—and they believe this because of Albert Einstein and Stephen Hawking.

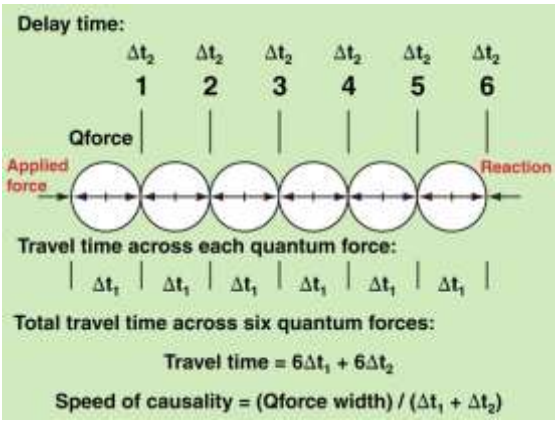
Does universal time really exist?

- It simply isn't logical that something that we can neither detect or measure, can have such an influence over the whole of the universe.
- What does time actually do that allows the universe to move from one moment to the next?
- The logical answer is that universal time does not exist as a semi-independent parameter, but exists solely as a consequence of the existence of the universe, but the questions is: How?

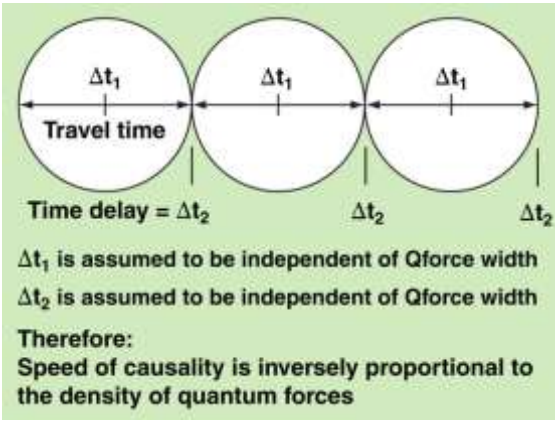
The origin of time



The movement of time



Speed of a force message



Speed of causality

Told you so!

Introduction

- If time did not exist as an independent variable, but instead existed as a consequence of our existence, then 'time' must be linked to 'movement', because without movement, time has no meaning.
- So, it would not be 'time' that allows us to move from one hour to the next, but in fact it is our movement and our actions that allow the existence of time.
- Thus, 'time' is not an enabler of movement, but a consequence of movement.

The speed of causality

- We can define the speed of causality as a measure of:
  - the speed of light, or
  - the speed of an energy message, or
  - the speed of a force message.
- In a force-based model of the universe, the speed of causality means the speed that a force message can travel through an individual quantum force, or a field of quantum forces.

The speed of causality cannot be infinite

- If the speed of causality was infinite, then:
  - there would be zero-time delay between the application of a force, and the formation of its equal and opposite force (Newton's 3rd law of motion)
  - all actions would occur instantaneously
  - the universe would progress from the Big Bang to the final collapse of the universe in zero seconds.
- Therefore, the universe exists because the speed of causality causes a 'delay'.

Time exists as a consequence of the speed of causality

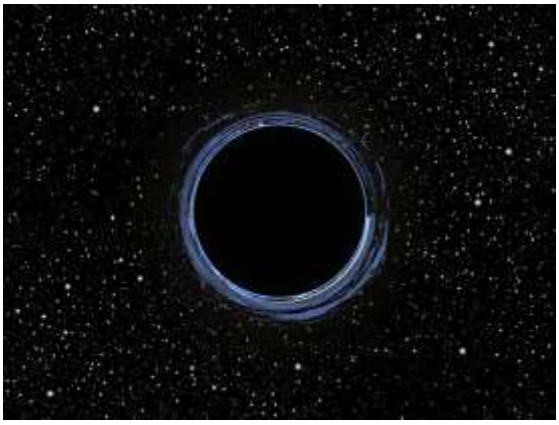
- If we accept that the speed of causality has a measurable value, then the creation of the universe would take a period of time.
- Therefore, time would exist solely as a consequence of the speed of causality.
- This means that a relationship must exist between 'time' and the 'speed of causality', which should have been the basis for Einstein's theory of relativity.

Understanding the relationship between 'time' and the speed of causality

Scientific knowledge

Introduction

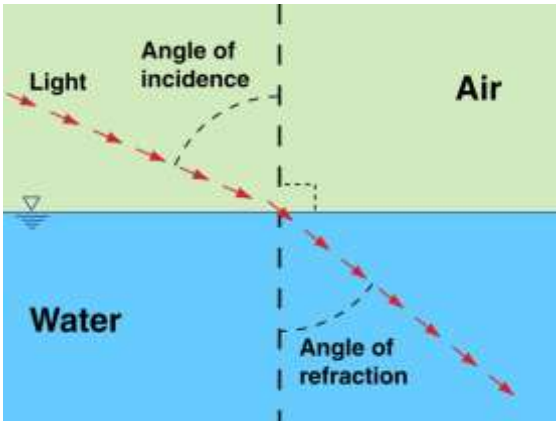
- Unlike Albert Einstein, I have access to some of the scientific knowledge that has been gained over the past few decades.
- This knowledge allows me to believe that the speed of causality slows as the density of quantum forces increases, which means the speed of causality is inversely proportional to the density of matter.
- I also believe that this relationship would apply independent of whether the matter is, or is not, translucent.



Black hole

The assumed relationship between 'time' and the 'speed of causality'

- Currently 'science' believes that:
  - the rate of time slows as you move towards the surface of the Earth from a location outside the Earth's atmosphere
  - time stops within a black hole
  - the speed of light slows as the density of the media increases; therefore, the speed of causality is believed (by me) to slow as the density of the media increases.



Refraction of light

The aging of butter

Outcomes from this 'new' relationship between time and the speed of causality

- If it is true that the speed of causality slows with an increase in the density of matter, then the likely outcomes would be:
  - time would stop within a singularity (i.e. at the start of the Big Bang)
  - time could have been very slow during the initial stages of the Big Bang (???)
  - the rate of time would increase as the universe expands
  - time would stop within a black hole (Stephen Hawking)
  - the rate of time would be fastest in deep space, but would slow as a person travelled into the increasing density of Earth's atmosphere (proven)
  - the speed of causality, and thus the speed of light, would be slower in water than in air, which would cause the refraction of light (observed)
  - as the temperature of matter increases, the density of attached quantum forces decreases, which means the rate of time would increase, which means the 'aging' process of the matter would accelerate (observed).

Understanding how ‘time’ functions in our lives

Clock time

Introduction

- If we can accept that ‘time’ does not control the ‘passing of time’ or the ‘rate that actions occur’, but instead it is the rate of actions that controls the apparent passing of time, then we can begin to understand the true function of time within our universe.
- What this really means is that every atom, and every cell in your body experiences its own rate of time, and its own rate of aging.

Aging

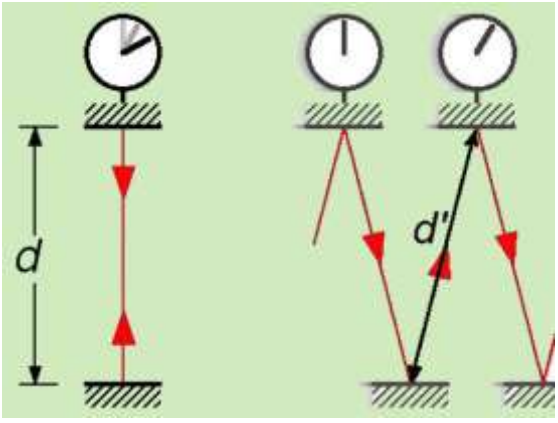
Our personal rate of aging

- It is hard for our minds to accept that we are all living with our own rate of time.
- To some degree we can control our personal ‘time’ by controlling our rate of aging, or in other words, the rate of ‘actions’ occurring within the atoms and cells of our body.
- As warm-blooded creatures, we humans have only limited control over the temperature-related effects of our aging process, but not all parts of our body exist at a controlled temperature.

Understanding the universe

‘Time’ vs velocity

- Einstein told us that the rate of time was linked to velocity.
- He claimed that as you approach the speed of light, ‘time’ would slow to a stop.
- In order to understand this effect, we need to consider the relationship between the ‘speed of causality’ and ‘velocity’.
- The real issue is understanding what would happen to the movement *within* each atom when the velocity of those atoms approached the speed of light.



Einstein’s atomic clock

Einstein’s atomic clock

- Einstein used the thought experiment of a moving atomic clock to demonstrate that time must stop at the speed of light.
- I believe that this thought experiment is false for the following reasons:
  - the atomic clock would travel with its own attached quantum forces (aether), which would mean that the movement of the bouncing atomic particle would be independent of the velocity
  - the ‘bouncing’ atomic particle would not stop at the speed of light.

The effect of temperature on the aging process

Butter

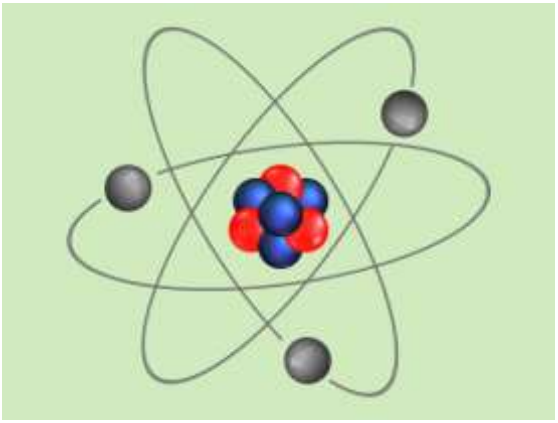
Introduction

- Everybody knows that perishable goods, such as milk and butter, age slower when they are kept at a lower temperature.
- This demonstrates that temperature has a connection to the ‘aging’ process.
- Temperature is a product of ‘heat’.
- Heat is a measure of the concentration of free and attached quantum forces.
- The density of quantum force affects the speed of causality, which affects the aging process.

Heat

Using temperature to advance the ‘aging’ process

- When companies develop new products that are expected to ‘age’ with time, they can test the possible ‘rate of aging’ of their new products by placing them in a heated environment.
- At an increased temperature, the normal aging process is accelerated, and thus the company can determine how quickly a product is likely to ‘age’, without having to wait the full duration of the normal aging process.



Atom

The link between temperature and aging

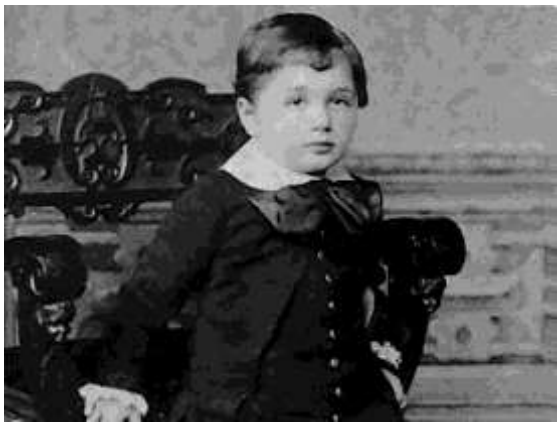
- The aging process is not controlled by ‘time’, but by the rate of activity of atoms and chemistry, which is governed by the speed of causality.
- Increasing the temperature of matter causes an increase in the density of free quantum forces held around and within an atom, which reduces the shell radius, and increases the angular velocity of the orbiting electrons, which increases the vibration of the atom, which increases the rate of aging (see Chapter 12).

Toast

The effect of heat on the ‘aging’ process

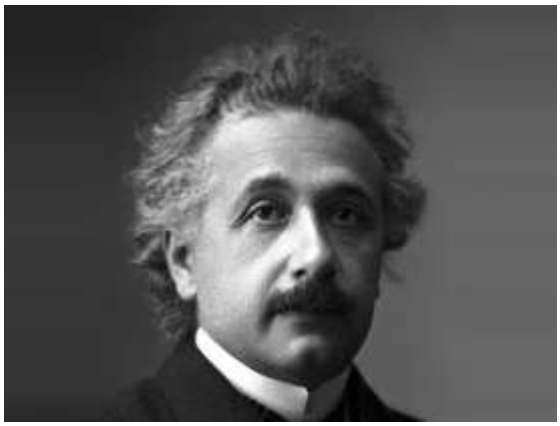
- A localised source of heat will indirectly cause a localised increase in the speed of causality, which will increase the rate of all actions, which can increase:
  - the rate of chemical reactions
  - the rate of oxygenation of a material
  - the rate of ‘aging’ of a material.
- The action of toasting bread is equivalent to advancing the ‘aging’ process—toasted bread is simply warm stale bread, but leaving the inner non-toasted core ‘fresh’.

The aging of people

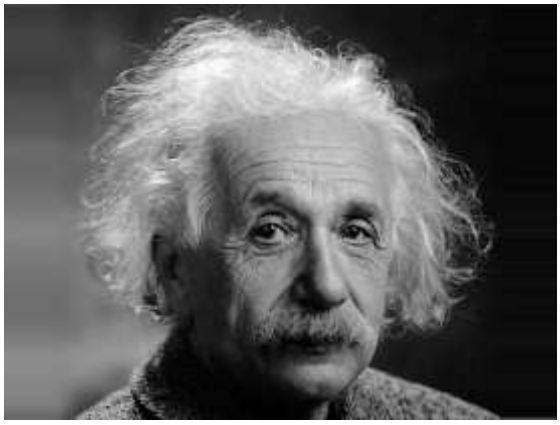


Albert Einstein (1882)

Albert Einstein (1904)



Albert Einstein (1921)



Albert Einstein (1947)

The aging process

- The aging process is believed to have two components, the programmed aging that is built into your DNA, and the consequences from damage to your DNA.
- Human cells die and are replaced after approximately 50 cell divisions—thus the skin you place cream on as a youth is not the same skin you live with as an adult.
- Your skin becomes less elastic with the aging process, and your body renews this 'aged skin' with similar looking 'aged skin' because your DNA has changed.

Matter being altered by energy and matter

- If you place an object in sunlight for an extended period of time, the object deteriorates due to the effects of the light, not due to the passing of time.
- We know that matter can influence the movement of adjacent matter—the mechanics of atoms, gravity, and the movement of planets, confirms this fact.
- Of course, the 'matter' that is in closest contact with your DNA is your own body.
- Your body is made of matter, which is just another form of energy. Your DNA is also made of matter. Your DNA ages your body through the growth and renewal phases, and the constant changes to your body can alter your DNA, which further alters your body's renewal process.
- Minor damage to your body (such as a scratch) can be fully repaired, but major damage (a cut which needs stiches) may alter your DNA, and thus the scar may become a permanent feature of your body.
- Your DNA can also be altered by the movement of the matter that surrounds you, such as the effects of sunlight, heat, and radioactivity.

The influence of the sun on the aging of our skin

- Sun protection creams may protect our skin from the damaging effects of UV rays, but not from the aging effects of temperature.
- Even though the internal temperature of the human body is well-regulated, our skin can experience a wide range of temperatures.

Therefore, people that spend a lot of time with their skin exposed to heat will experience an acceleration in the aging of their skin.

Lessons

Time does not exist as an independent variable

- Based solely on the author's understanding of the physics of the universe (which has not been proven), 'time' does not exist in the form that is commonly believed by scientist, and taught in schools.
- 'Time' is not a variable to existed prior to the Big Bang.
- 'Time' is not a variable that is independent of the actions generated by forces.

Time is generated by the speed of causality

- Based solely on the author's understanding of the physics of the universe (which has not been proven), 'time' is generated by the 'actions' of forces caused by the speed of causality of these forces.
- If the speed of causality were infinite, then zero time would have passed between the beginning and end of our universe—but it didn't.

The rate of time is dependent on the density of quantum forces

- The speed of causality is a 'mechanical' operation governed by the laws of physics.
- The speed of causality depends on the physical arrangement of the quantum forces that fill the media through which force messages travel.
- Therefore, the speed of causality depends on the density of the quantum forces.
- Therefore, the rate of time depends on the density of the quantum forces.

The 'aging' of organic matter is governed, in-part, by temperature

- The 'aging' process is solely, or in-part, linked to the rate of 'actions'.
- At an atomic level, the rate of actions is linked to temperature.
- Therefore, the 'aging' of organic matter is, in-part, governed by the temperature of that organic matter.

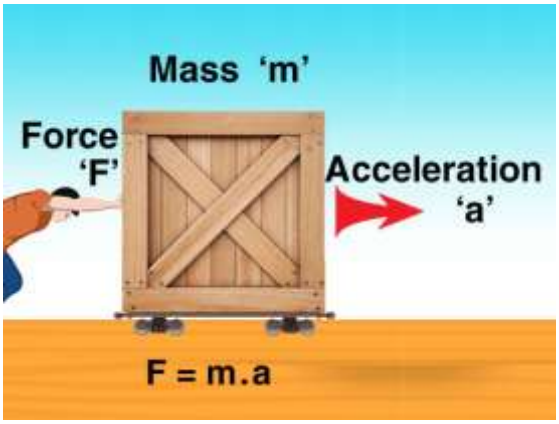
7. The Property of Mass

Introduction

Mass

Introduction

- Previously in this paper I proposed that the existence of physical matter is just an illusion generated by quantum forces.
- I now need to take that argument one step further by demonstrating that the properties of mass, momentum and inertia are generated by the 'speed of causality'.
- The properties of 'mass' are important because they are associated with:
  - our sense of touch, and
  - its resistant to acceleration.



Force, mass and acceleration

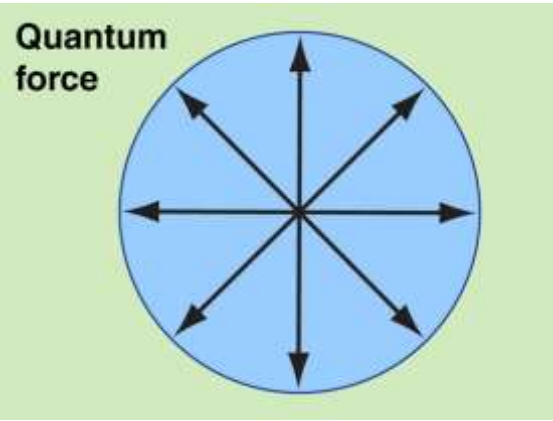
Newton's third law of motion

- The force required to accelerate an object of mass is given by:

$$F = m.a$$

where:

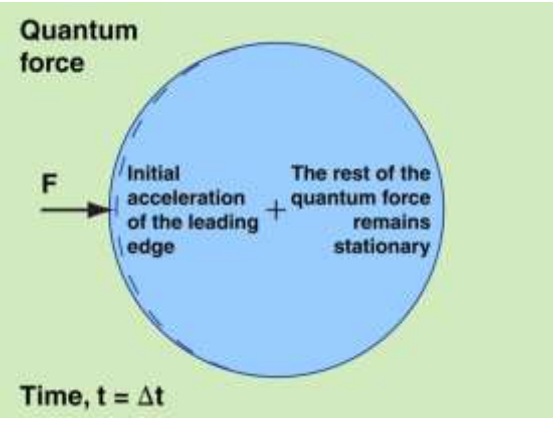
- F = force [N]
- m = mass [kg]
- a = acceleration [m/s/s].



Region of influence

The region of influence of a quantum force

- This discussion requires us to consider a quantum force as some type of entity that fills a volume of space.
- Even though a quantum force has no physical existence, and no specific dimensions, we must assume that the actions of a quantum force extend over a region of influence.
- Due to the speed of causality, there will be a time delay for a force message to travel across this region of influence.

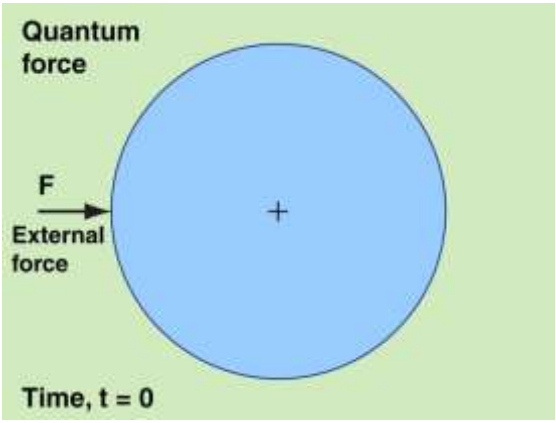


Progression of a force message

The application of an external force to an individual quantum force

- If an external force is applied to the leading edge of the quantum force, this leading edge will begin to move.
- However, the force message has yet to travel across the region of influence, so the rest of the quantum force has no reason to move, and it doesn't.
- Even though this force message travels at the speed of light, this time delay is able to generate a resistance to acceleration, which is the property of 'mass'.

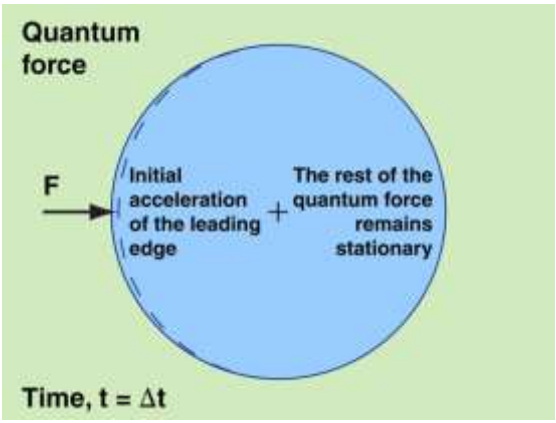
Movement of a force message across a quantum force



Time zero

Initial application of a force

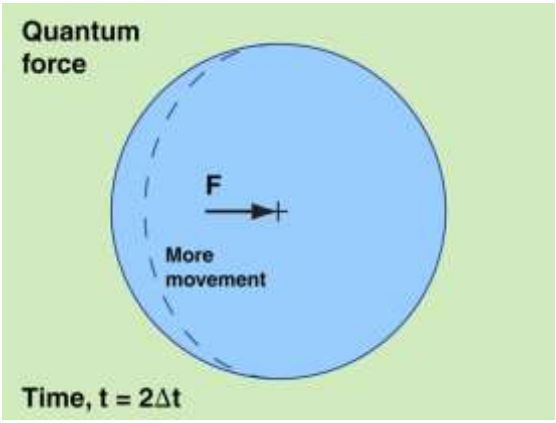
- This diagram represents a region of influence of a quantum force, with an external force (F) applied to the leading edge of the region of influence.



Initial movement

Initial movement of the leading edge

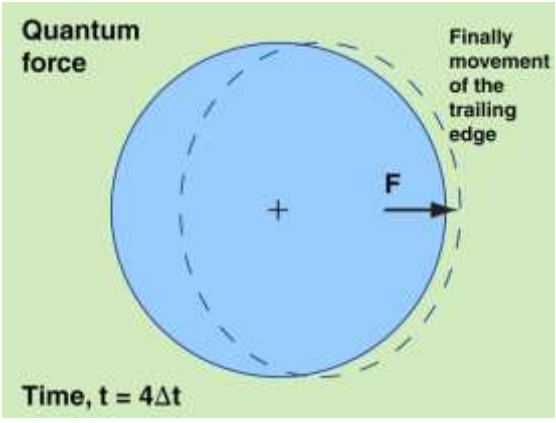
- Initially, **only** the leading edge of the region of influence would respond (move) because only this region currently registers the existence of the external force.
- The rest of the quantum force would remain stationary because there is no force being applied to the remainder of the region of influence.



Further movement

The force message has travelled halfway through the region of influence

- In this diagram it is being suggested that it has taken a time delay of 2Δt for the force message to travel half the width of the region of influence.
- At this stage, only half the quantum force is wanting to move, and half remains stationary.

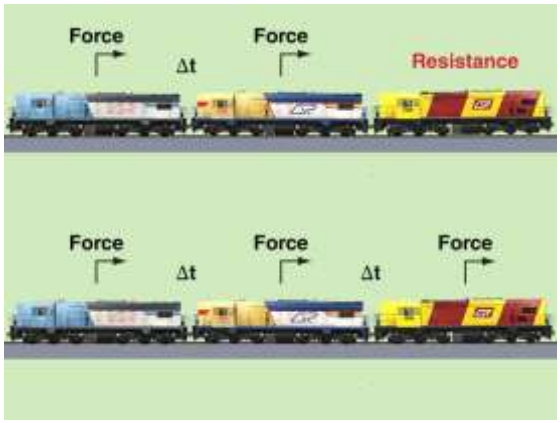


The force message has travelled fully across the region of influence

- This diagram suggests that a time delay of 4Δt has been generated by the speed of causality while the force message travels the full width of the region of influence.
- While a force continues to be applied to any quantum force, the region of influence will remain distorted, and the quantum force will generate a resistance to any form of acceleration.
- Only when a constant velocity is achieved will the region return to its original shape.

Effects of the speed of causality

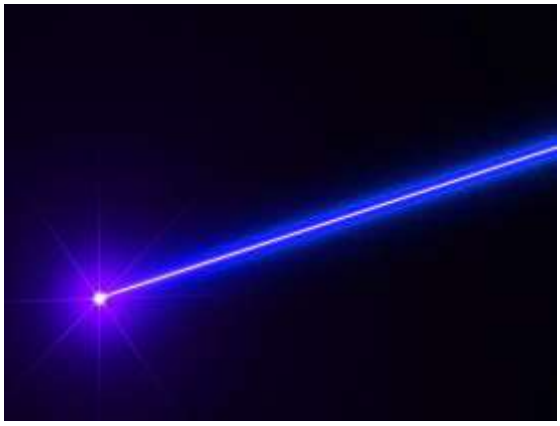
Initial movement of locomotives



Final movement of locomotives

Consider the following situation:

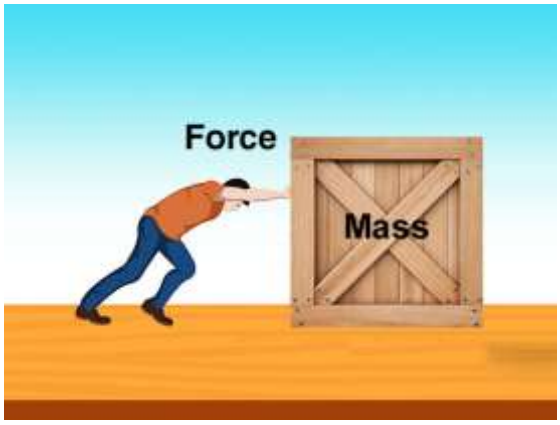
- In order to appreciate the effects that the speed of causality has on the application of an external force to a quantum force; I have provided this example of three diesel locomotives.
- The first locomotive gets the message to start moving, but this message has not reached the other locomotives.
- When the first locomotive tries to move, it experiences the resistance of the other two locomotives.
- After a short interval (Δt), the second locomotive kicks into action and begins to contribute to the movement, but its force message (acceleration) is out of phase with the first locomotive.
- Another time interval passes and the third locomotive begins to contribute to the movement, but it too is out of phase with both the first and second locomotives.
- Only when the force message is the same for all three locomotives, and this force is balanced by the train's drag, will the train achieve a constant velocity, and its mass will cease to play a role.



Light

The transmission of 'light'

- It is my belief that the speed of a force message passing through physical matter, i.e. the speed of causality, is inversely proportional to the density of the free and attached quantum forces in that matter.
- It is also my belief that when light passes through physical matter, such as air, water and glass, it does not move through the particles of matter, but rather is passes through the quantum forces that are attached to this matter (which relates to how 'sound' travels through solid walls).

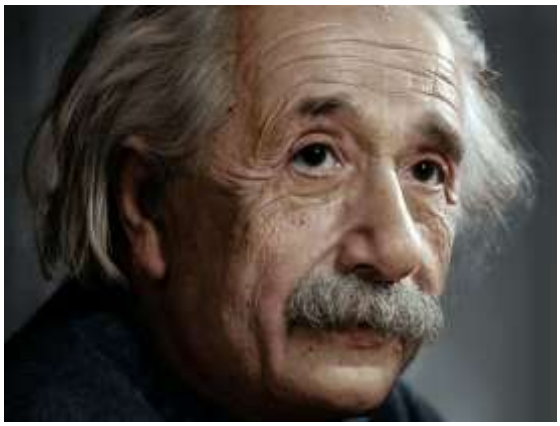


Mass

Total mass

- If it is accepted that the physical property known as 'mass', results from the travel time of a force message passing through a quantum force, then this means that:
  - all quantum forces have the property of 'mass', including free, attached and concentrated (i.e. matter)
  - total mass = density of quantum forces times the volume of quantum forces
  - the speed of causality (i.e. the speed of light) is inversely proportional to the density of quantum forces.

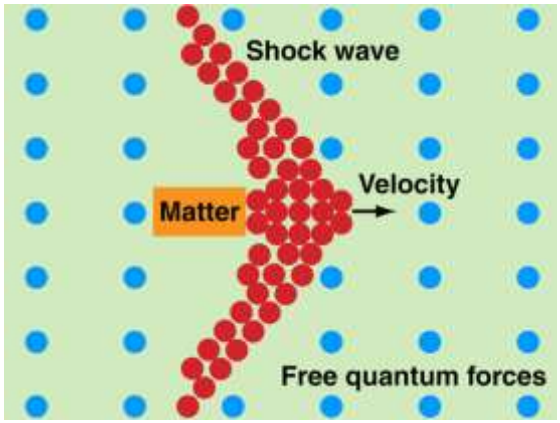
Accelerating ‘physical matter’ up to the ‘speed of light’



Albert Einstein

Introduction

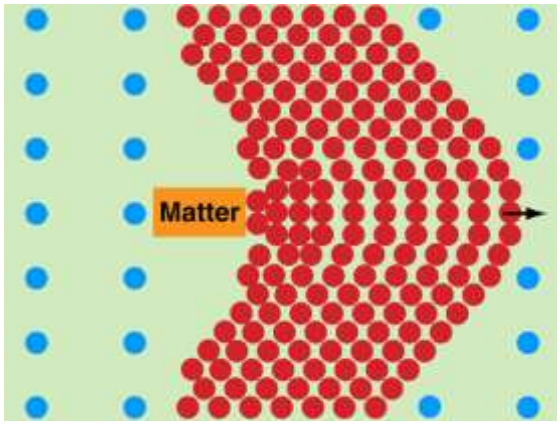
- One of Einstein’s predictions was that an object of physical matter would generate an infinite amount of mass if it were to achieve the speed of light.
- We can consider this issue using our knowledge of fluid mechanics and shock waves, and our assumptions of quantum forces and their property of mass.
- We know that light travels at the speed of causality, which means that ‘light’ travels at the critical velocity of ‘space’.



Shock wave

The acceleration of an object of matter

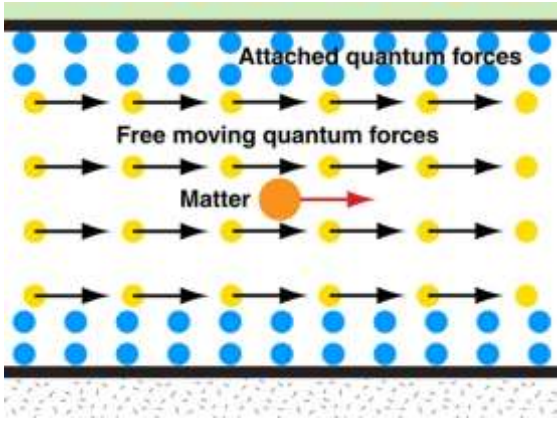
- If an object of physical matter were to accelerate through ‘space’, then according to the force-based model of the universe, the object would be travelling through a field of free quantum forces.
- As the object’s speed approached the speed of light, it would begin to generate a shock wave of quantum forces in front of the object.
- A shock wave would form because the field of quantum forces could no longer behave like an ideal fluid.



Further growth of the shock wave

The generation of infinite mass

- No ‘force message’ could move ahead of the shock wave, so quantum forces ahead of the shock wave would not being moving out of the way of the speeding object.
- The forced acceleration of the quantum forces would generate the effects of extreme mass.
- Therefore, as physical matter approaches the speed of light, it would appear too either:
  - meet infinite resistance, and/or
  - gain infinite mass.



Movement through the ‘tunnel’

CERN laboratory

- I understand that the CERN laboratory has accelerated matter to a velocity close to the speed of light.
- I believe that this was possible because they were indirectly accelerating the free quantum forces that filled the acceleration tunnel.
- What would have limited their acceleration would have been the fixed quantum forces that remain attached to the stationary walls of the acceleration tunnel.

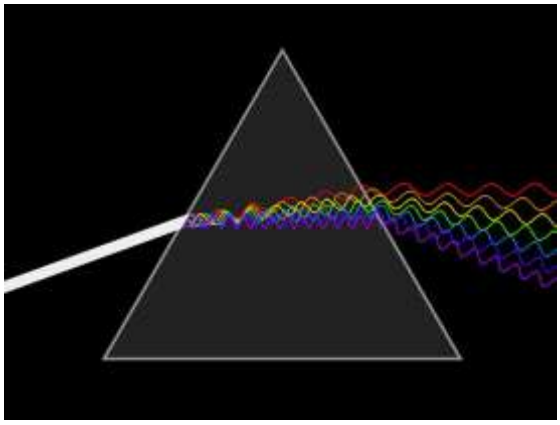
8. The Properties of Light

Introduction

Light

Introduction

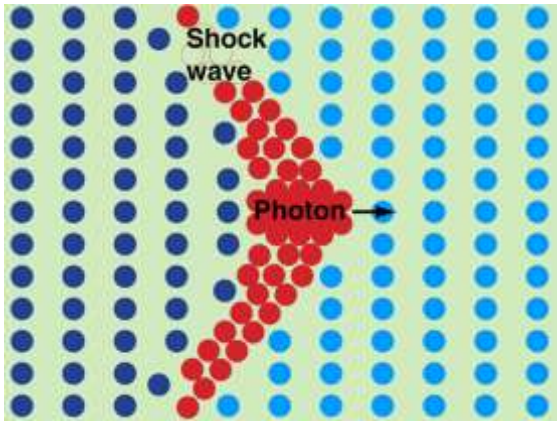
- Scientists have debated for years if light travels as a particle or a wave.
- Fluid mechanics is able to confirm that light travels as a compression wave of the media through which it travels.
- This means that light has the properties of an energy wave, not a particle wave.
- Just as air particles do not move with the energy of a sound wave, the quantum forces that occupy all media do not move with the energy of light.



Light

Light

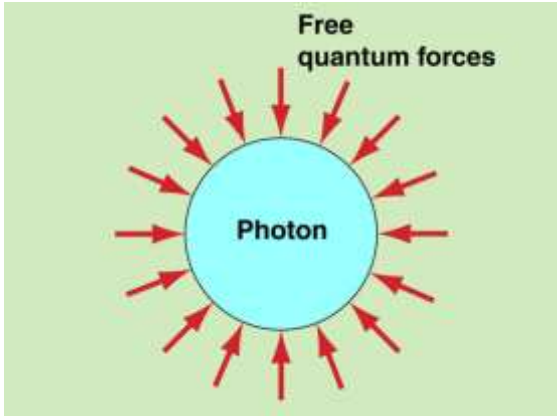
- Light, like everything in the universe, is formed from the concentration of quantum forces.
- However, light only exists as a transient particle, meaning that the concentration of quantum forces is not sufficient in size to form a stable unit of matter.
- Consequently, 'light' travels as a compression wave of quantum forces, called a photon, which is similar to 'sound' travelling as a compression wave of air.



Possible arrangement of a photon

A photon of light

- In this paper it is being suggested that the movement of a photon at the speed of causality generates a shock wave, which expands the effective size of a photon.
- The alternative theory to the expanded size of a photon is that the concentration of quantum forces (that forms the photon), causes a similar, but declining, concentration of quantum forces around the photon (like a 'shield'), which would subsequently move as a shock wave.

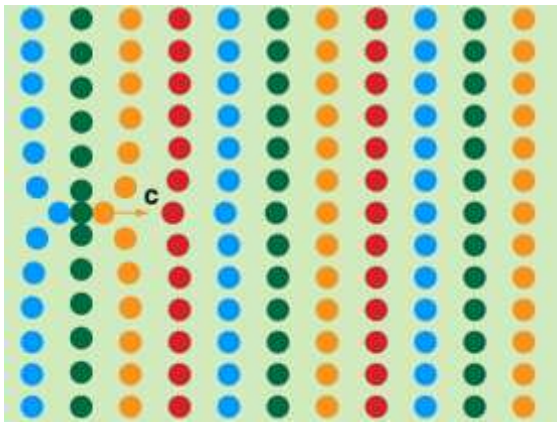


Stabilised photon

The stability of a photon

- Like any concentration of quantum forces, at any instant, the concentration appears to be stable because of the surrounding non-concentrated quantum forces.
- If the photon loses too much energy, then there will be insufficient inward force to maintain its stability, which will cause the photon to collapse back into free quantum forces.
- All photons eventually turn back into 'free' quantum forces (i.e. 'space').

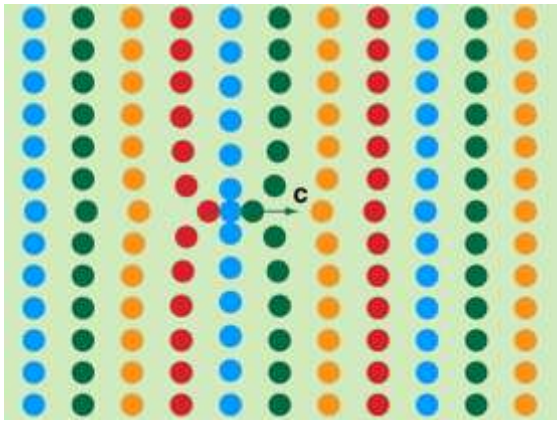
Comparing energy waves and particle waves



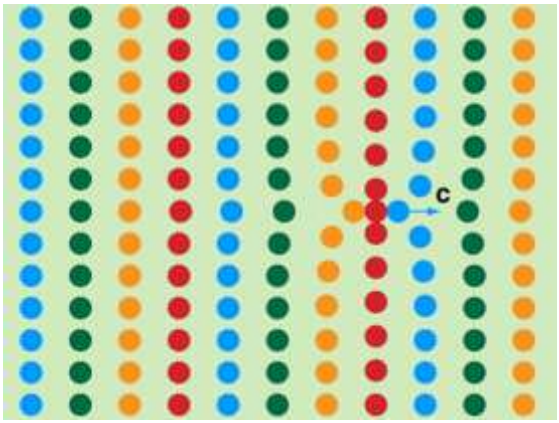
Virtual movement of energy

Energy wave

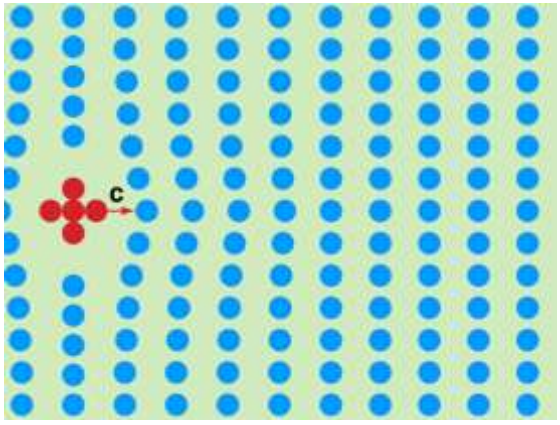
- It is difficult to demonstrate the difference between an energy wave and a particle wave using still images, but these images are the best I can do.
- An energy wave moves as a compression wave of the media through which it is travelling.
- As an energy wave moves, only the energy moves, not the particles that form the media (therefore, the coloured dots in these images return to in their original position).



Movement to the blue column



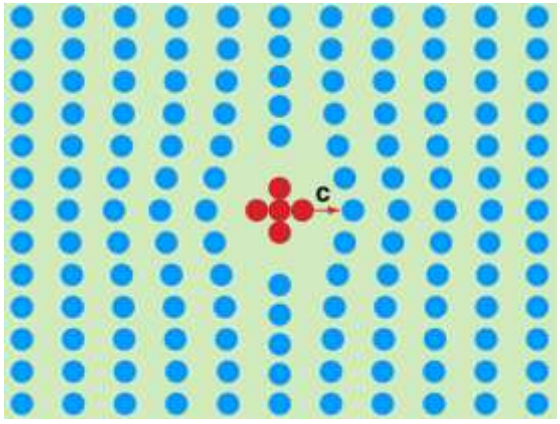
Movement to the red column



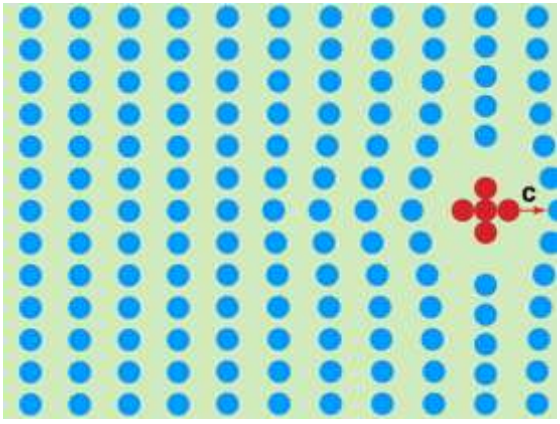
Particle movement

Particle wave

- When a particle wave moves, the particles that form the wave, will move with the wave.
- If light moved as a particle, then light would have mass, and it would not be able to travel at the speed of causality.
- Light is not a particle, the same as a sound wave is not a stable grouping of air particles; it is an energy message, which displays virtual movement, allowing it to travel as a massless wave.

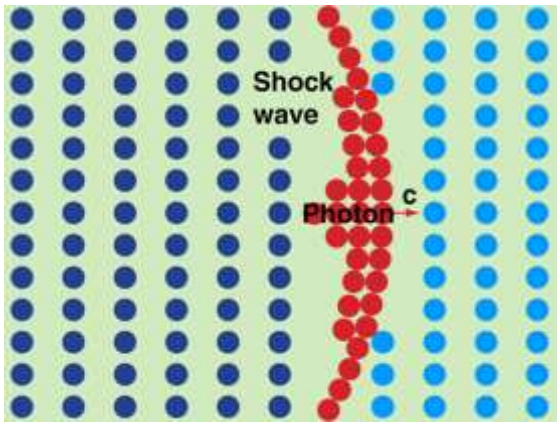


Particle pushes energy units away



Particle content stays together

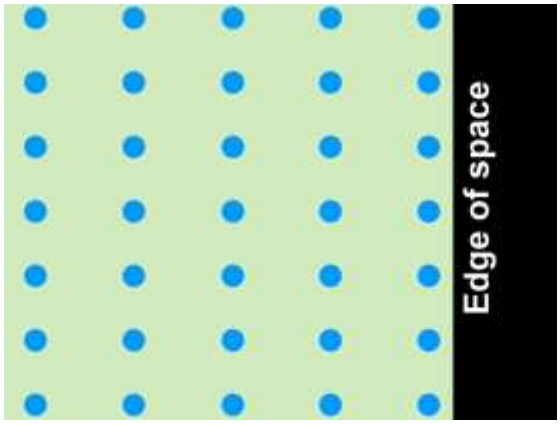
Proof that 'light' travels as an energy wave



Photon pulse

Introduction

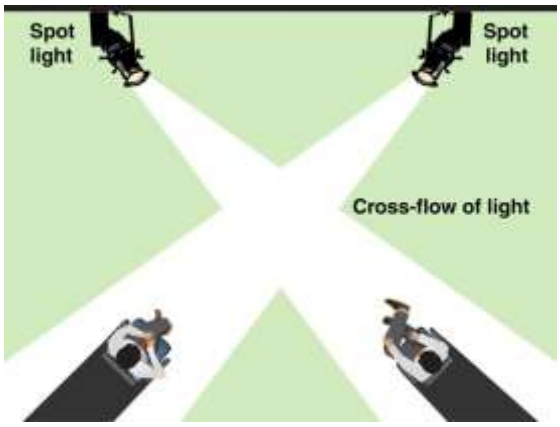
- Light travels as an energy wave.
- Light does not transport particles.
- The energy wave moves as a compression wave (pulse) of concentrated quantum forces (aether).
- The central component of a photon moves as a virtual particle, just like the cursor on your computer screen.



The edge of space

Expansion of the universe

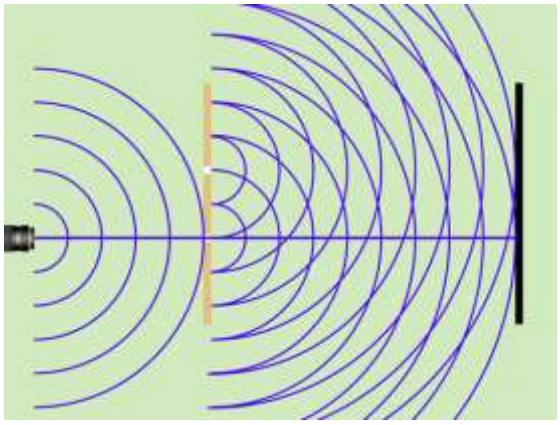
- Conformation of the energy wave theory can be seen in the rate of expansion of the universe.
- If light did exist as a particle wave, then such particles would be able to travel beyond the current edge of space.
- This would mean that the universe would expand at the speed of light.
- **However, when a photon reaches the edge of space it becomes unstable and simply converts into more 'space'.**



Cross flow of light beams

Energy and momentum transfer

- Conformation of the energy wave theory can also be seen in the fact that two beams of light are able to pass freely through each other.
- Rather than transferring energy and momentum between the photons, light allows the photon energy to pass through other photons without an exchange of energy, or a change in direction.
- Consequently, a beam of light cannot be deflected by another beam of light (refer back to page 38).



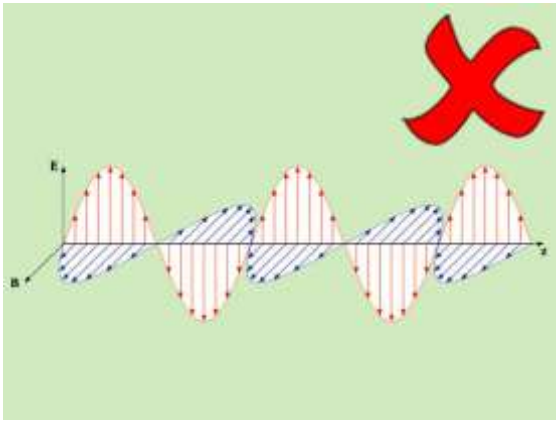
Double slit experiment

Constructive and destructive interference

- Conformation of the energy wave theory can also be seen in the constructive and destructive interference observed in the double slit experiment.
- Particle waves cannot experience constructive or destructive interference.
- Only energy waves can experience constructive or destructive interference.

Lesson: Not all waves share the same properties of movement.

Light moves as a longitudinal wave, not as a transverse wave

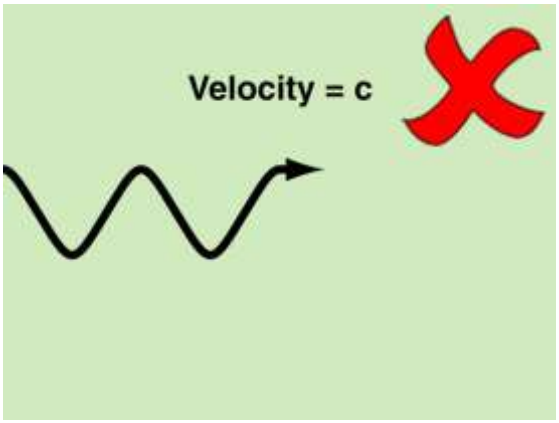


Light is not electromagnetic radiation

Is light a form of electro-magnetic radiation?

- A petrol engine produces exhaust gases, but that does not mean that a car is a form of exhaust gas—the gas is a consequence of the car's operation.
- Similarly, the movement of light produces magnetic effects, but that does not make light electromagnetic radiation.

However, all languages are 'invented', so if we choose to call the movement of light 'electromagnetic radiation', then so be it.

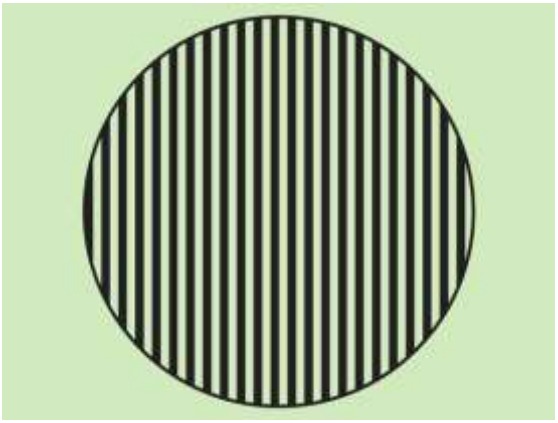


Light is not a transverse wave

Light travels as a longitudinal wave

- Light exists as a compression wave (pulse) of quantum forces.
- This compression wave moves through the media of free quantum forces in the same way that sound waves move through the air or other media.
- A compression wave is a longitudinal wave, not a transverse wave.

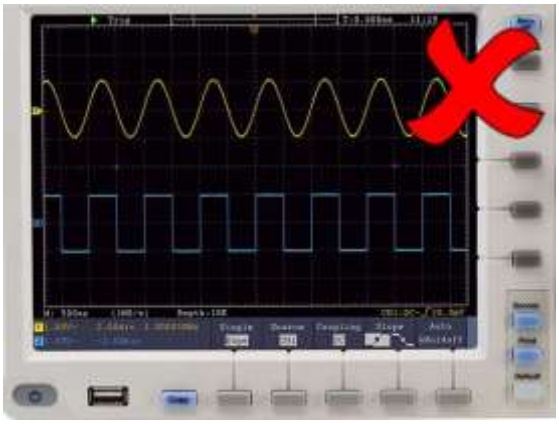
The fact that light may, or may not, generate the effects of a transverse wave as a by-product of its movement, does not make light a transverse wave!



Polaroid (vertical-slot) filter

The polarisation of light

- The filtering of light through a polaroid filter does not prove that light moves as a transverse wave.
- Light exists as a centroid of concentrated quantum forces, surrounded by a three-dimensional shock wave (shield) of less-concentrated quantum forces.
- A photon will lose part of its shock wave when it moves through a filter, which temporarily turns a 3D wave into something like a 2D wave.

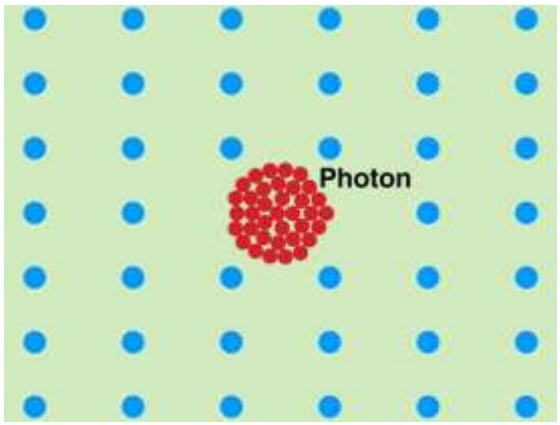


Oscilloscope

Oscilloscope

- Just because an oscilloscope plots the pulse of a wave as a transverse wave, does **not** mean that the wave that is being monitored is a transverse wave!
- What is displayed on the screen is just a representation of the wave's energy cycle.

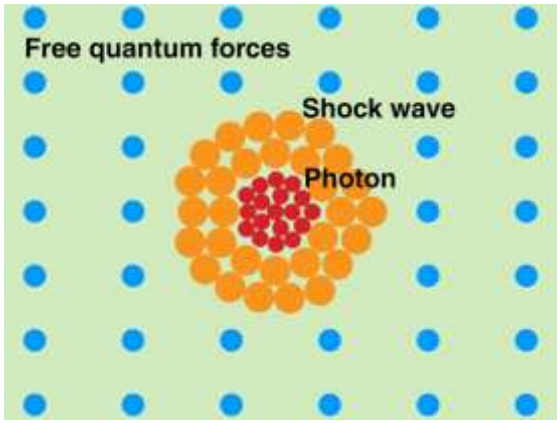
Passing light through a filter



Initial photon pulse (front view)

Initial photon

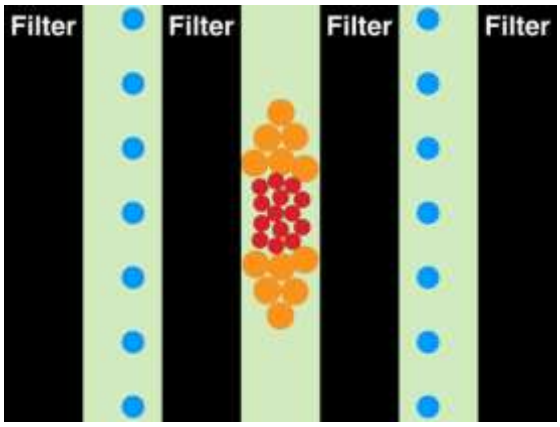
- A photon is a concentration of quantum forces, which is held in compression by the free quantum forces that surround the photon.
- There are no quantum forces attached to a photon; hence, no 'attached' quantum forces.



Photon and shock wave (front view)

Building of the shock wave

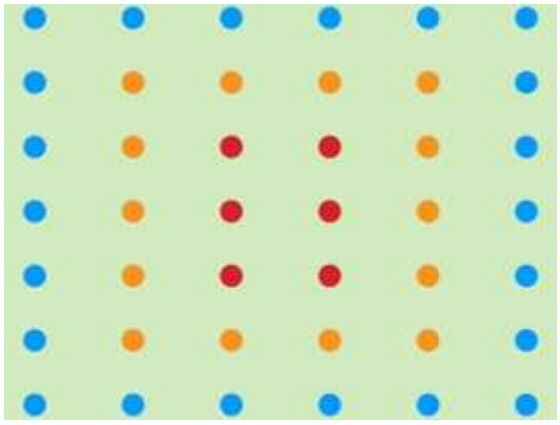
- The movement of a photon at the speed of causality creates a shock wave, which travels with the photon.
- The shock wave is also transient, and is formed from the same compressed quantum forces as the central photon.
- Even though a photon has a diameter of a fraction of a millimetre, the shock wave can have a diameter that grows to a size of several centimetres (as evident by the action of filters).



Filtered light (front view)

Passing light through a filter

- When a photon and its shock wave pass through a polaroid filter, most of the shock wave is removed from the photon.
- The photon will either:
  - pass through one of the gaps
  - impart a force onto the atomic particles that make-up the 'filter', after which the photon will convert back into free quantum forces, or
  - reflect off the filter.

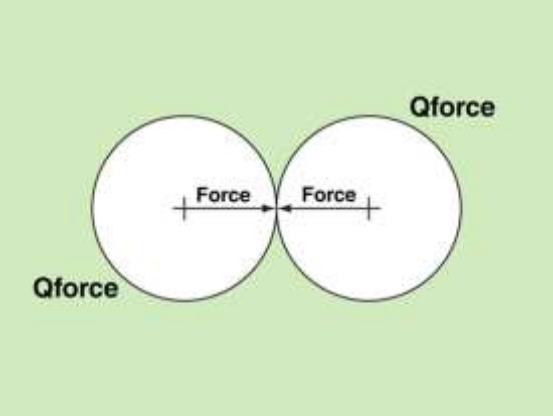


Collapse of a photon (front view)

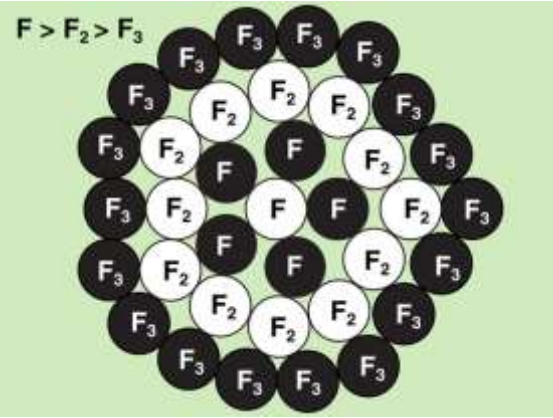
Collapse of the photon

- After passing through a narrow gap, the photon will try to rebuild its shock wave.
- If the rebuilding of the shock wave takes too much energy from the photon, then the photon will no longer have sufficient 'energy' to maintain its stability.
- Just like the collapse of a half photon, these depleted photons will collapse and return back into free quantum forces.
- It is relatively easy for a photon to just 'disappear' (i.e. no longer be visible).

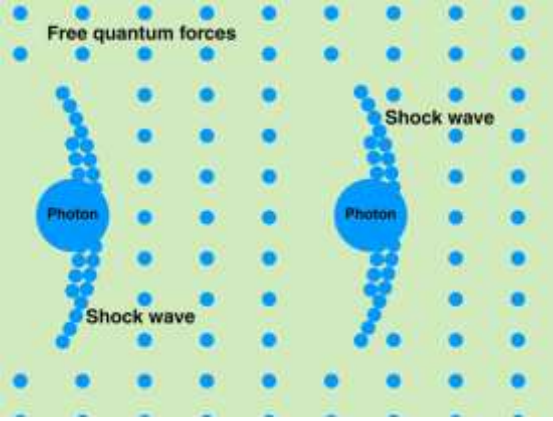
The movement of light generates ‘electricity’ and ‘magnetism’



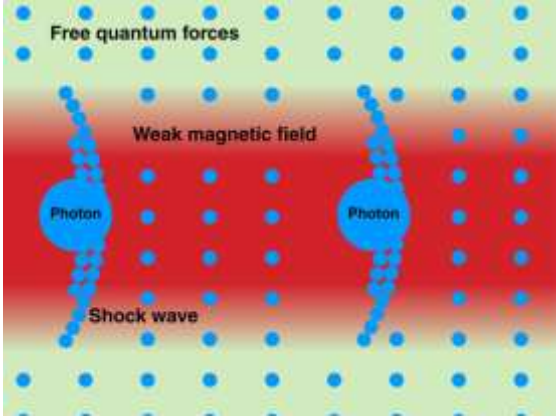
Repelling force



Concentration of quantum forces



The flow of photons



Weak magnetic field

Quantum forces

- In order to understand the relationship between light, electricity, and magnetism, we need to return to the properties of a quantum force.
- A quantum force has only one task, that is to repel other quantum forces.
- Through this one action it can be demonstrated that a concentration of quantum forces will be surrounded by free and attached quantum forces, which provide the necessary inward force that allows the concentration to remain stable.
- Through this simple action of physics, quantum forces are able to form stable concentrations of quantum forces, ultimately forming physical matter, planets, and the rest of the universe.
- Consequently, the stability of a concentration of quantum forces (i.e. matter) depends on the existence of the surrounding field of free and attached quantum forces.

Light generates a low electrical current

- Even though light travels as a virtual particle, the movement of the photon is similar to the flow of electrons, which allows the movement of light to generate the faint existence of an electrical current.

Light generates a low magnetic field

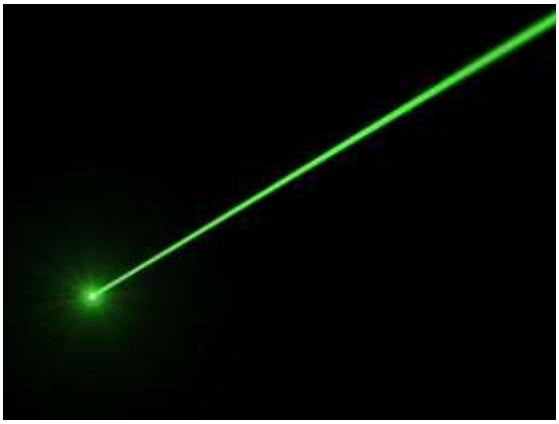
- As light travels, the movement of the shock wave simulates the flow of free quantum forces, which allow the movement of light to generate the faint existence of a magnetic field.
- Collectively, this makes the movement of light to behave like electromagnetic radiation.

The speed of light

I am a little confused!

Introduction

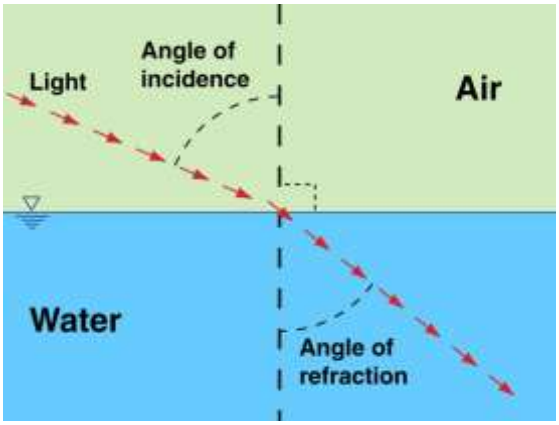
- Unfortunately, I would need to learn a lot more about light and electromagnetic radiation before I could be confident in my description of the link between the movement of light and the generation of electrical and magnetic properties—sorry!



Light

Why does light travel at the speed of light?

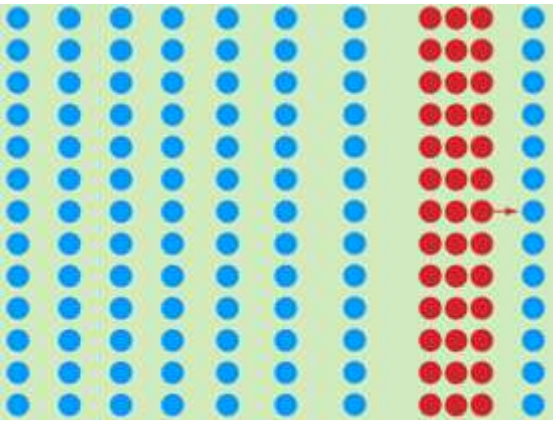
- The question of why light travels at the speed of light has worried me for years.
- It could be as simple as the fact that a force message travels at the 'speed of causality', which depends on the density of free and attached quantum forces.
- Therefore, a photon, which is a compression wave of quantum forces, will move at the speed that a force message is able to travel within a given field of quantum forces.



Refraction of light

The changing speed of light

- It is my belief that the speed of light depends on the density of free or attached quantum forces, which is proportional to the density of the physical matter through which it is travelling.
- What causes light to accelerate when it moves from glass to air is the fact that the speed of causality is faster in air than it is in glass.
- Nothing 'pushes' the photon, it is just the speed of a force message in different media.



Fully developed energy shock wave

Growth of the shock wave

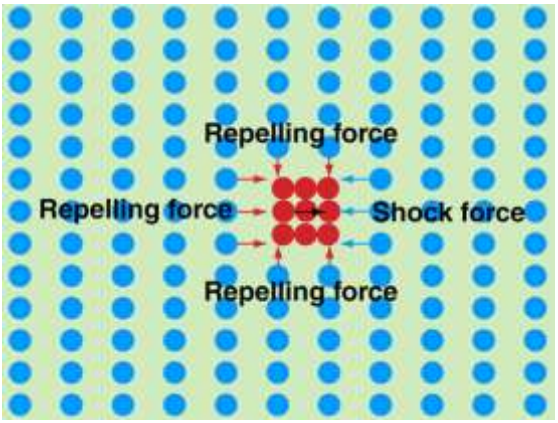
- According to fluid mechanics, a shock wave that travels at the speed of causality (i.e. the critical velocity) will have a near-straight profile (i.e. level with the photon).
- However, I expect the shock wave could have a curved profile during its initial development.
- The maximum diameter of the shock wave could depend on the intensity of the light (i.e. the energy of the initial photon).

An explanation of why we can see stars at night

Question

Question:

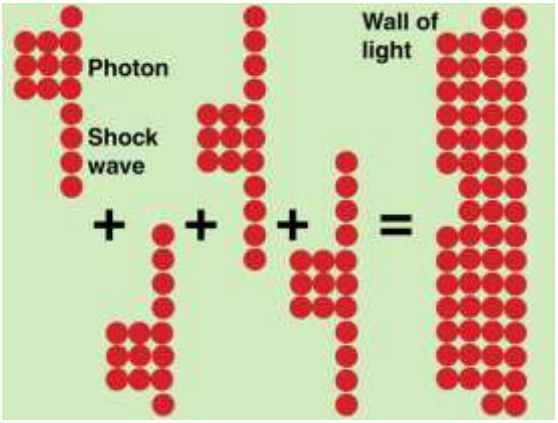
- **Have you ever asked yourself:** How many photons would need to leave our closest star if, after travelling for four light-years, a group of them could arrive in your eye with enough energy to be registered by your brain, yet, if you move just 1 cm to the left, another group of photons would arrive at that location.
- That means there would be enough tightly packed photons to completely fill the surface area of a sphere with a radius equal to four light-years. Wow!



Forces acting on a photon

The effects of gravity on photons

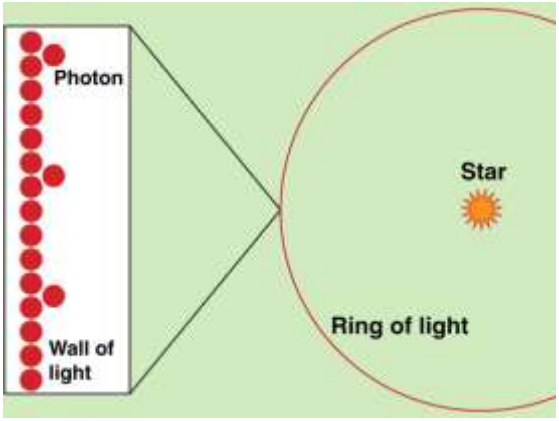
- This paper suggest that a photon is held together with the same force of gravity that holds planets together.
- Without this gravitational effect, the quantum forces contained within the photon would simply disperse into the surrounding aether.
- But what happens to the photon and its shock wave as it travels for several light years?



Overlapping shock waves

The superposition (constructive interference) of shock waves

- As each photon travels on its long journey from a star to your eye, its attached shock wave will, technically, continue to expand, but in reality, there will be a measurable limit to this expansion.
- When two shock waves are in close proximity, the same quantum forces that push planets together, also push the shock waves together forming a more intense (i.e. visible), three-dimensional shock wave.

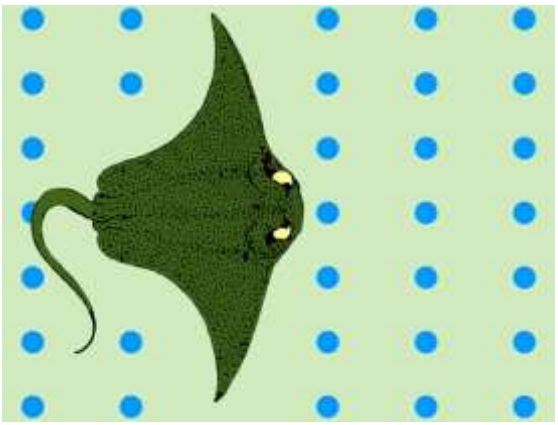


A ring of light projected from a star

The structure of light as it travels vast distances

- Over the vast distances of space, the individual photons and shock waves will eventually join together forming a giant spherical wave (ring) of light.
- Many overlapping shock waves will increase the energy density around the full ring of light to a point where the human eye can detect not just the photons, but also the shock wave.
- These three-dimensional shock waves would carry the full colour spectrum.

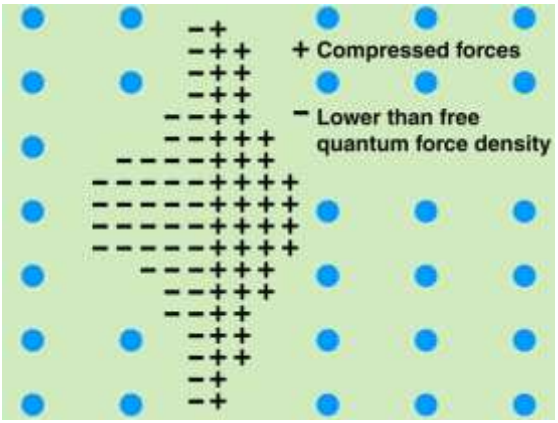
White light travels as a spectrum of colours



Manta ray

Introduction

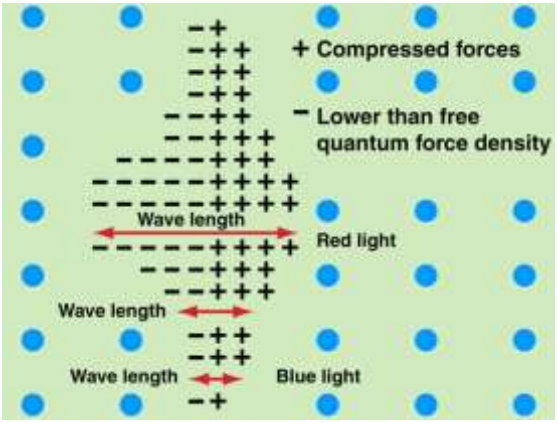
- Readers can imagine a photon and its shock wave moving through a field of free quantum forces like a manta ray passing through water.
- (Except, a photon is very much three-dimensional, while the manta ray is more two-dimensional.)



Photon and shock wave

A collection of compressed and relaxed quantum forces

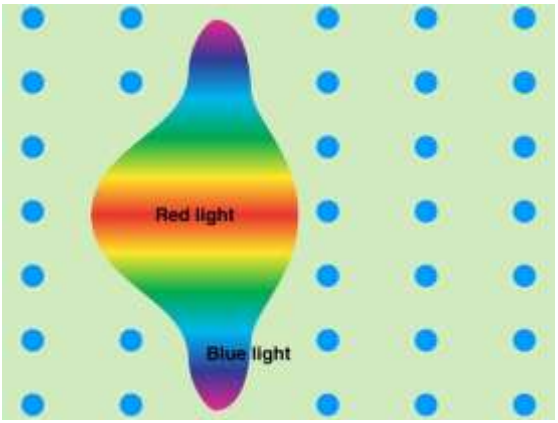
- The photon starts as an isolated concentration ('+' in the diagram) of quantum forces, which begins to form an attached shock wave.
- Behind the photon and shock wave there will be a region of quantum forces where the density of quantum forces is lower ('-' in the diagram) than background levels.



Wave length

Variable wave length

- The wave length at any location within a photon and shock wave is defined by the length of the compression (+) and trough (-) at that location—just like any other longitudinal wave.
- The three-dimensional shape of a photon and shock wave means that a photon of white light would carry a range of wave lengths, and thus colours.
- In addition, the intensity of the photon can also vary the contained wave lengths.



Colour spectrum

The visible colour spectrum

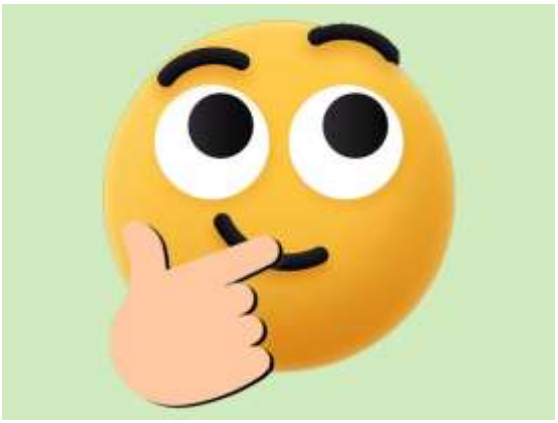
- White light travels with a full range of colours and wave lengths.
- The colour spectrum of a photon would have the shorter wave length blue light at the outer ends of the shock wave, and the red light in the centre.
- The sky is blue because the outer edges of the shock wave are the first to be ripped from the shock wave.
- The red-shift of light travelling through space is caused by the stronger centre of a photon of light.

The refraction of light

I feel so alone

Introduction

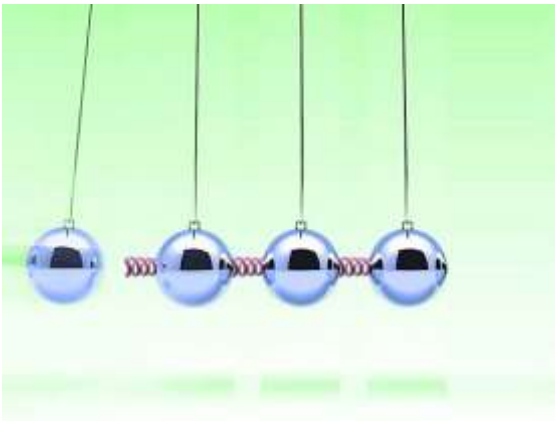
- Einstein based his theories on physics and mathematics, whereas I base my theories on fluid mechanics and wave theory.
- Therefore, when it comes to any discussion about astrophysics, Einstein wins hands-down.
- However, when it comes to a discussion about wave refraction, diffraction, and reflection, I hope I can at least stand toe-to-toe with most astrophysicists.



Thinking

The Internet has some strange ideas!

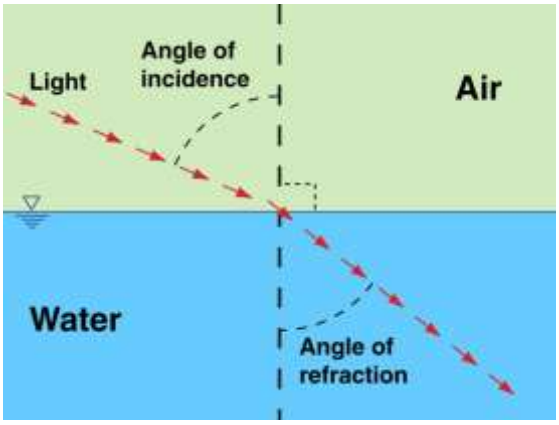
- The refraction of light is not caused by light bouncing off electrons.
- Refraction is not caused by light stopping to have a chat and coffee with particles in the new media.
- Refraction is not caused by soldiers or tanks moving over muddy ground.
- Refraction is also not caused by the interference from the excitation of electrons which may, or may not, cause the generation of magnetic fields.



The slowing speed of causality

Refraction of light

- The primary cause of the refraction of light is the same as it is for the refraction of water waves—that being the partial slowing of the energy wave.
- The speed of the energy wave associated with a photon is governed by the speed of causality, which reduces as the density of free energy (quantum forces) reduces.
- The density, or distribution, of free energy reduces as the density of concentrated energy increases (really important!).
- As the density of a translucent material increases, the density of free energy inside the material must decrease, which means the speed of causality of the free energy component of the material must decrease, which means the speed of light within that material must decrease.
- Even though an ocean wave appears to move in one direction, the pressure force radiates out in three-dimensions from any point within the wave.
- Similarly, the energy message of a photon radiates out in 3-dimensions, and it is this 'force' that is slowed in a non-symmetrical manner, which causes the refraction.



Refraction of light

Lessons

Light travels as an energy wave

- Our observation of the movement of light tells us that light travels as an energy wave, not as a particle, or a particle wave.

Light travels as a longitudinal compression wave, not a transverse wave

- Light travels as a longitudinal compression wave, similar to sound waves.
- The movement of light does generate a mild magnetic field, but this does not mean that light travels as a transverse wave.
- The actions of light passing through a filter are dominated by the shock wave attached to a photon, not by the effects of a transverse wave.

The speed of light is not a constant, and it depends on the density of quantum forces

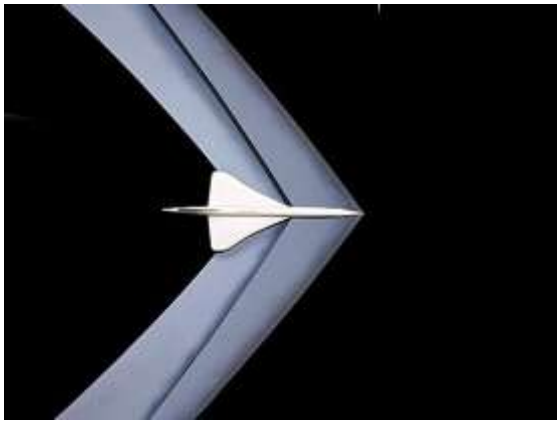
- The speed of light is a mechanical operation governed by the laws of physics.
- The speed of light depends on the physical arrangement of the quantum forces that fill the media through which light travels.
- Therefore, the speed of light depends on the density of the free and attached quantum forces that fill the media through which light travels.

All the colours of visible light travel together as ‘white’ light

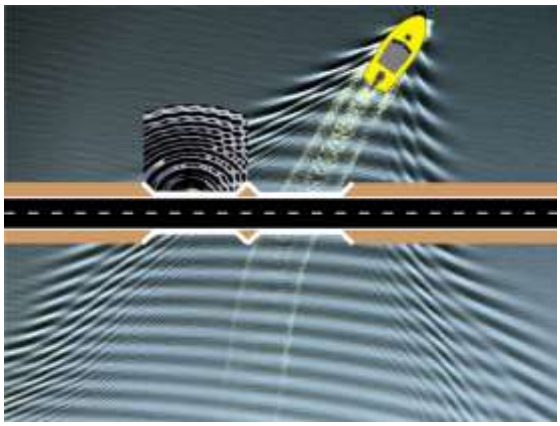
- A photon of light, along with its attached shock wave, incorporate a wide range of wave frequencies due to the shape of the shock wave.
- A photon of light travels as white light, which effectively travels with a full range of visible colours.
- Filters can isolate parts of the shock wave, which effectively ‘filters’ specific frequencies of light (i.e. colours).

9. The Double Slit, and Triple Filter, Experiments

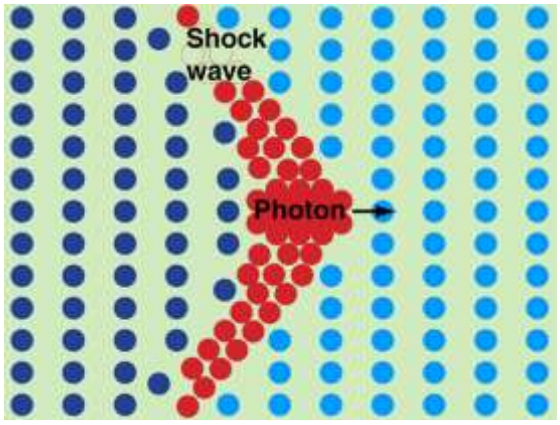
The Double Slit Experiment



Sound-based shock wave



Boat wake passing under a bridge



Possible arrangement of a photon

Critical velocity and shock waves in <u>air</u>

- If an aircraft accelerates through the sound barrier (i.e. the speed of a sound wave in air), a shock wave is formed.
- This shock wave travels with the plane because it is constantly being generated by the plane.
- The shock wave will trail behind the plane in a V-shape if the plane is travelling faster than the speed of sound, and the angle of this shock wave becomes more acute as the plane's speed increases.

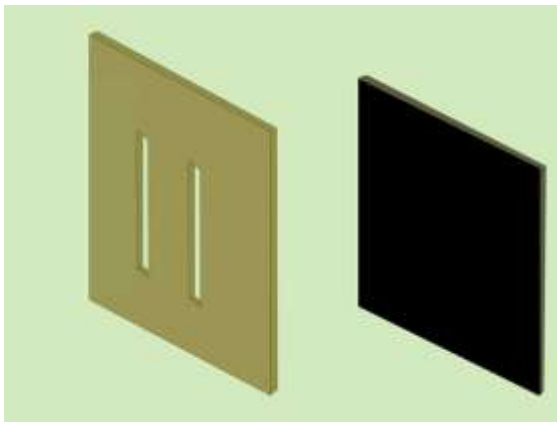
<u>Particles</u> that generate <u>waves</u>

- People should not be surprised that a photon displays the properties of both a particle and a wave, after all, many of the day-to-day items that we interact with have both particle and wave properties:
  - a plane with a sound wave
  - a car with an engine noise
  - a boat with a wake.
- If you drove a speed boat through a double arch bridge, then you would have the equivalent of a double slit experiment!

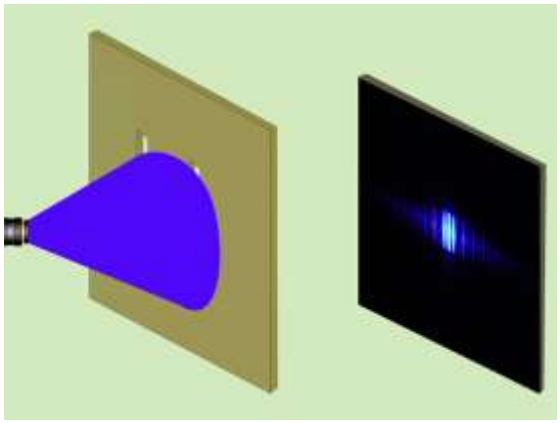
An expanding photon of light

- There are two theories for the formation of the wave that travels with a photon.
- The theory that has been adopted in this paper relates to the formation of a shock wave due to the speed of the photon.
- The alternative theory suggests that the concentration of quantum forces that forms a photon, causes a similar, but declining, concentration of quantum forces around the photon, which would draw a closer similarity to the expansion of sound waves.

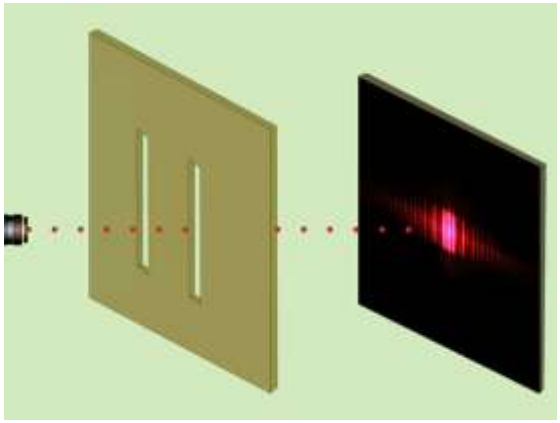
The double slit experiment



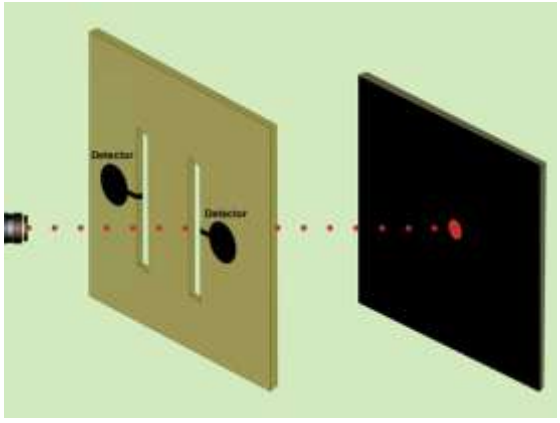
Test set-up



Blue-light torch on double slits



Projection of single photons



Counting each photon

The double slit experiment

- The double slit experiment involves projecting light onto two narrow slits cut into a screen, which allows some light to be projected onto a back screen.
- The double slit experiment can also be performed with a single fibre.
- The experiments are normally performed with a single colour of light in order to:
  - reduce the rainbow effect (because colours travel in the shock wave)
  - improve the sharpness of the image.

Results achieved from a beam of light

- If a single beam of light is projected towards the two slits, then the projected image will be:
  - a series of glowing bars of light
  - higher intensity light in the centre, flanked by much lower intensity bars.
- If a beam of light is projected onto just one slit, then the projected image will be:
  - a single column (bar) of light parallel with the slit.

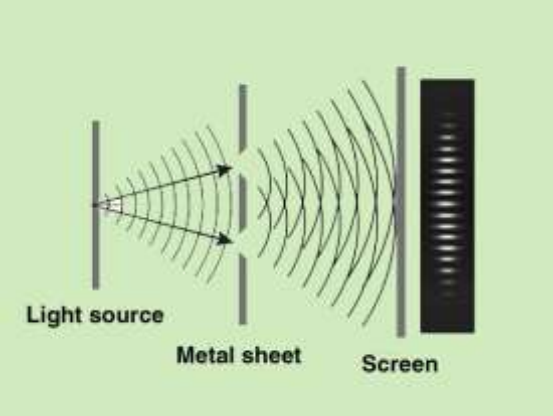
Results achieved from the projection of photons sent one at a time

- If a series of individual photons are projected towards the two slits, then the projected image will be:
  - similar to that produced by a beam of light.
- If a series of individual photons are projected towards a single slit, then the projected image will be:
  - a single dot, or column of light, depending on the angle of projection of each photon.

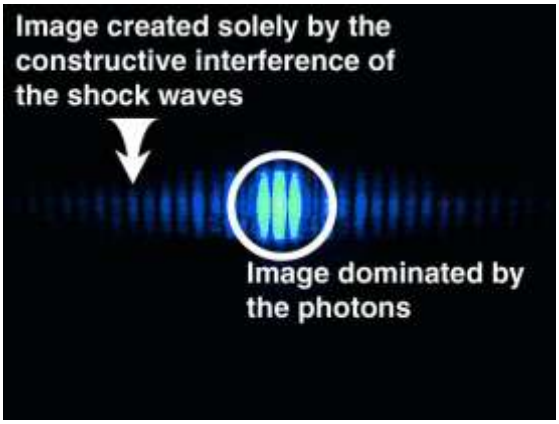
Results achieved when the photons are being watched

- If a detector is placed on one of the slits to count the photons passing through that slit, then the projected image will be:
  - a single dot or column of light.
- If detectors are placed on both slits, then the projected image will be:
  - the same outcome as above.
- The claim being that light reacts to being watched—**Yeah, right!** This is all part of the **magic** of light we are told to accept.

Explanation of the double slit experiment



Traditional illustration of wave conditions



Interference pattern

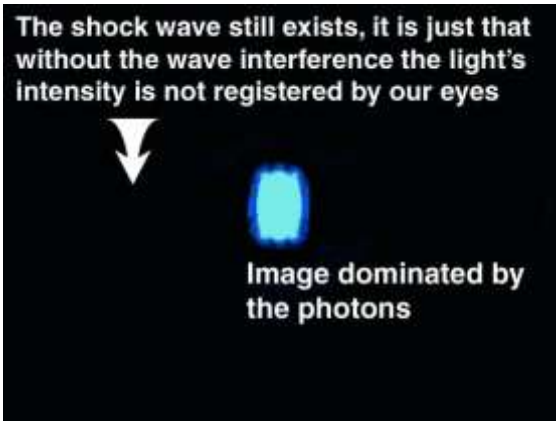
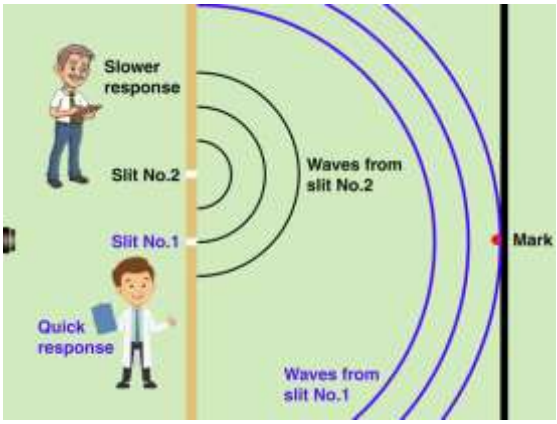


Image generated by a single slot



Phase shifting

Question:

- **Question:** What exactly are the semi-circular lines suppose to represent on traditional double slit diagrams (left)—are these lines suppose to represent electromagnetic waves?
- **Answer:** I suggest that these lines mimic what 2D water waves look like if they experience interference.
- However, by accident, these lines do represent the wave pattern of the energy shock waves that actually produce the interference pattern.

Beam of light projected onto <u>two</u> slits

- If a beam of light is projected onto two slits, then:
  - the photons will travel straight towards the back board (screen).
  - a few very weak energy shock waves will be developed by the photon in the beam of light, which will pass through both slits
  - some of the overlapping shock waves that hit the back board will have enough intensity to be visible.

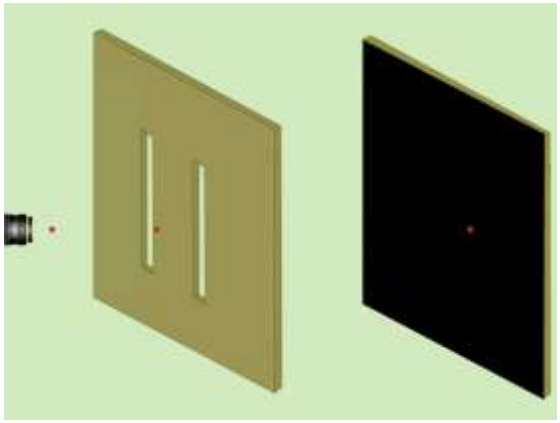
Beam of light projected onto <u>one</u> slit

- If a beam of light is projected onto just one slit, then:
  - a portion of the light will be projected straight onto the back board
  - a series of very weak shock waves will reconstruct after the beam of light passes through the slit, but these waves will not build a constructive interference pattern, and thus will not build the necessary intensity to become visible.

The 'observer' effect

- I cannot state with certainty what is happening without understanding the equipment that is being used to count the photons.
- However, the obvious explanation is that the detection equipment causes an ever-so-slight delay in the photons, and given the light speed of the shock wave, this delay could result in a phase shift occurring between the two sets of shock waves, even if a detector is placed on both slits.

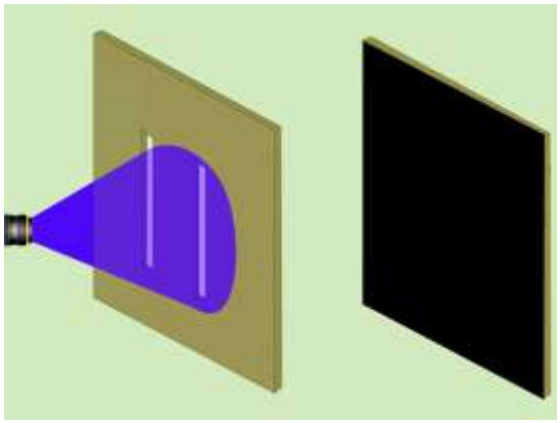
The explanation of a single photon test



Projection of individual photons

Initial travel of a single photon

- Individual photons will pass through whichever slit that they are aimed at.
- Nothing magic to see here!

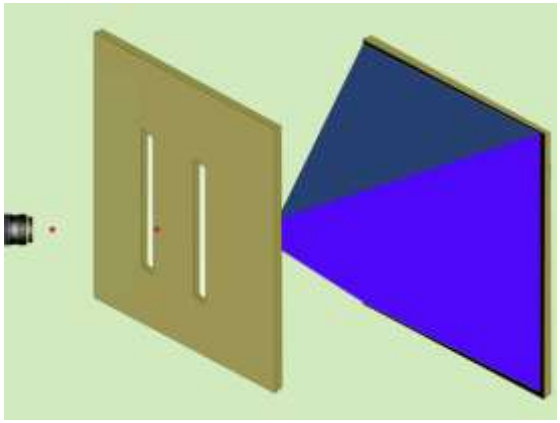


Initial energy shock wave

Initial shock wave

- Each photon will generate its own energy shock wave, which will likely expand to cover both the slits.
- What is important to note is the vertical height of the generated bars of detected light—this vertical spread of the light is important if the source of light is a laser.

The blue cone shown in the diagram represents the initial shock wave, not a beam of light.

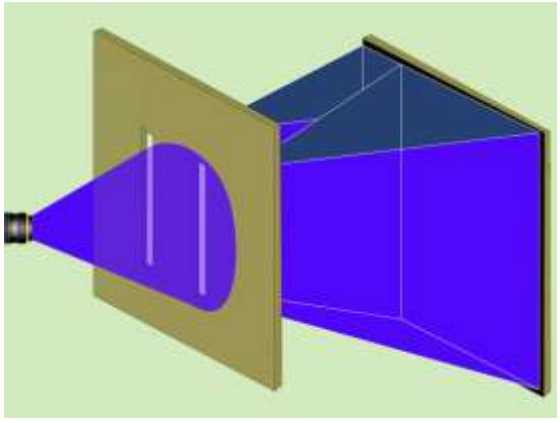


Secondary shock wave

Second photon-generated shock wave

- When the photons pass through the first slit, they will be stripped of most of their initial shock wave.
- The photons will then start to rebuild a new shock wave.

Again, the blue rectangular pyramid shown here represents the rebuilding of a new shock wave—one for each photon, independent of whether the photons are sent one at a time, or as a beam of light.

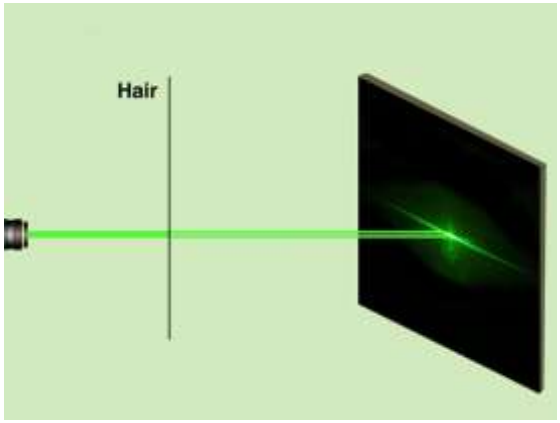


Shock waves formed from front wave

The shock wave-generated shock waves

- When the initial shock wave hits the two slits, most of the shock wave will be absorbed or reflected.
- Those parts of the shock wave that pass through the two slits will begin to expand once the shock wave has passes through the slits.
- These secondary shock waves will be much weaker than the initial shock wave.
- Constructive interference of <u>all</u> the shock waves will generate the <u>several</u> parallel columns of light that are observed.

An explanation of the single-hair test

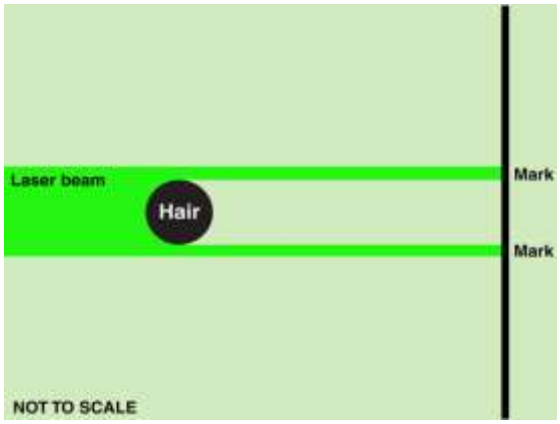


Split ray test using a human hair

Some facts

- The single-hair experiment works a bit differently from the double slits in that two semi-circular shock wave are produced each side of the hair (the shock waves are not able take the shape of a slit).
- Each photon within the beam of light will develop each of these shock waves.

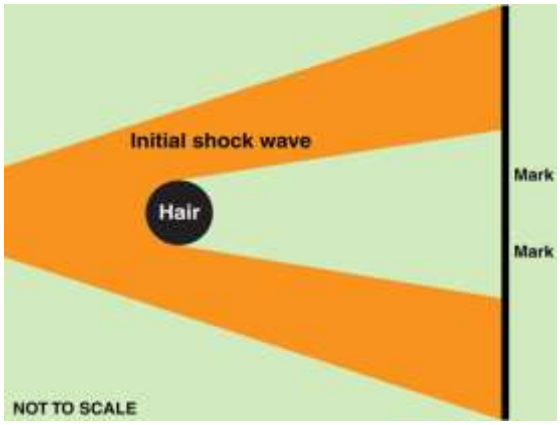
In order to explain the single-hair experiment, I have chosen to use top view diagrams in order to better display the multiple shock waves.



Laser beam

Beam of light

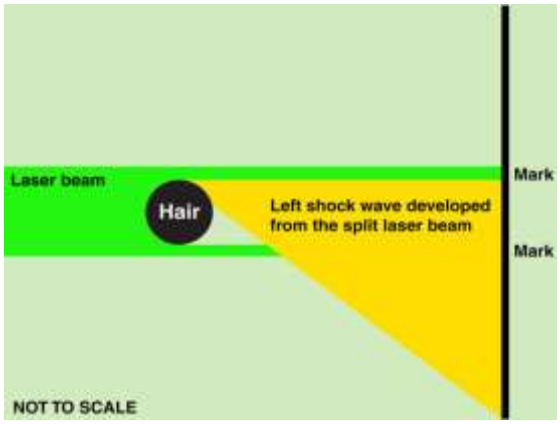
- The parts of the laser beam that can pass by the hair, will project straight onto the screen.



Initial shock wave

Initial shock wave

- Each photon in the laser beam will build its own energy shock wave, and many of these shock waves will join with each other.
- This initial shock wave will be partially blocked by the hair.



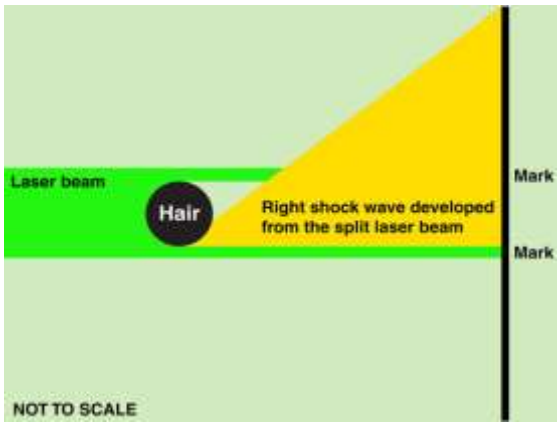
Building a new shock wave

Building a new shock wave

- The split beam of light will start to construct a new energy shock wave behind the hair.

Only the left side is shown here.

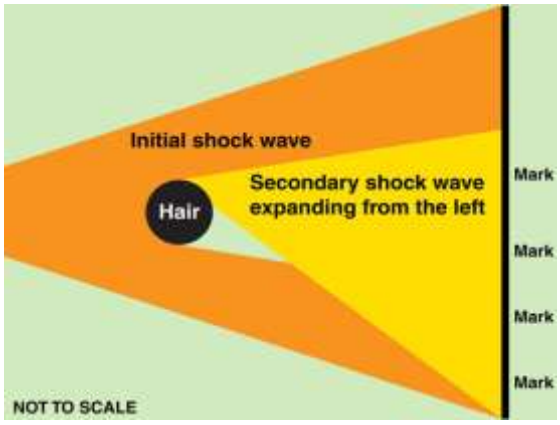
An explanation of the single-hair test



Building a new shock wave

Building a new shock wave

- Similar to that discussed for the previous image, but showing the right-hand side of the beam of light.

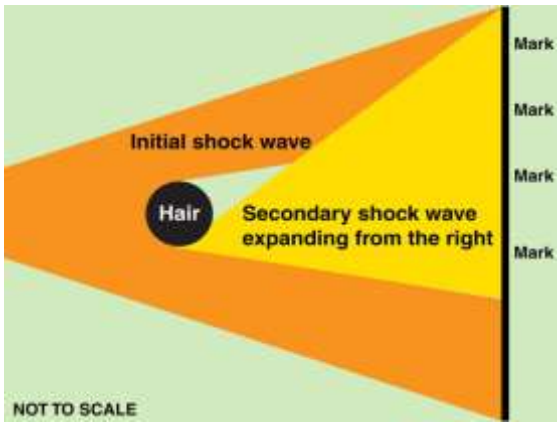


Building a new shock wave

Shock wave building a new shock wave

- The split initial shock wave will also begin to expand behind the hair.

Only the left side is shown here.

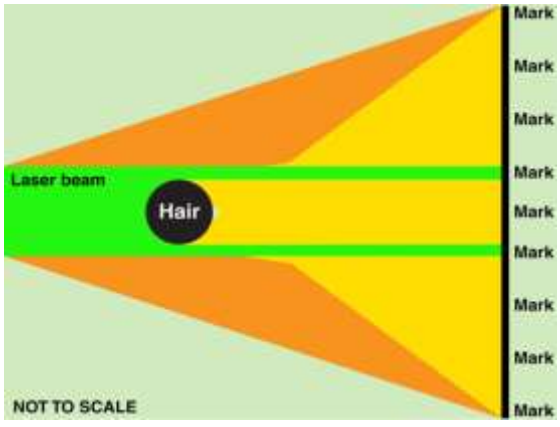


Building a new shock wave

Shock wave building a new shock wave

- Similar to that discussed for the previous image, but for the right-hand side of the beam of light.

Note; only the existence of these multiple shock waves can explain the **many** parallel bars of light, which the water wave theory cannot.



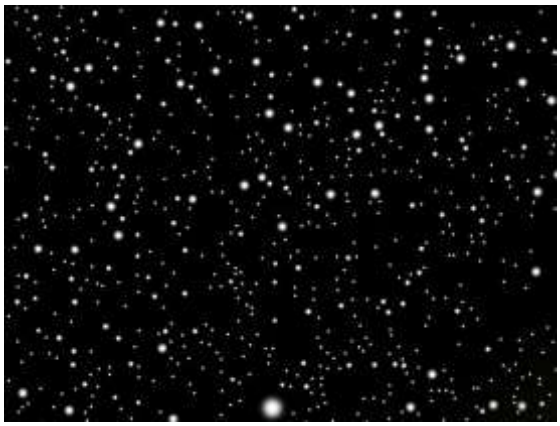
Overlapping energy shock waves

Final outcome

- This complex structure of light produces several evenly-spaced bars of light.
- Each photon within the beam of light will develop all five shock waves, so even though each shock wave has a **very** low intensity, thousands of small intensity glows can join to make a visible glow.

If you are looking for a challenge; try to figure out an explanation of the triple polaroid filter experiment before reading the next section.

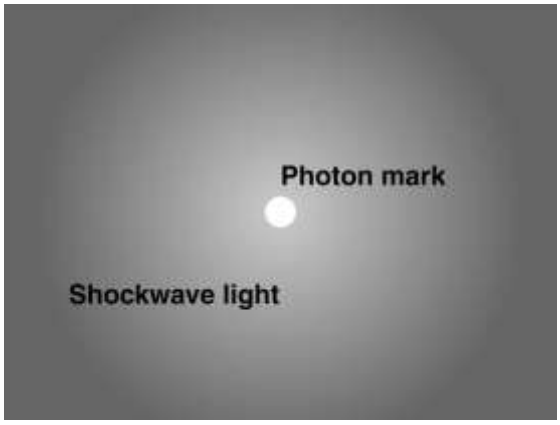
The properties of energy shock waves



Stars

Why can't we see a shock wave?

- **Question:** If an energy shock wave is just concentrated energy, and a photon is a localised concentration of energy, then why don't we see the shock wave?
- **Answer:** In some circumstances you do see the shock wave.
- When you look at stars at night, mostly what you are seeing is the shock wave.
- In the double slit experiment, you can see evidence of shock waves.
- When you see a colour spectrum, you are seeing evidence of shock waves.

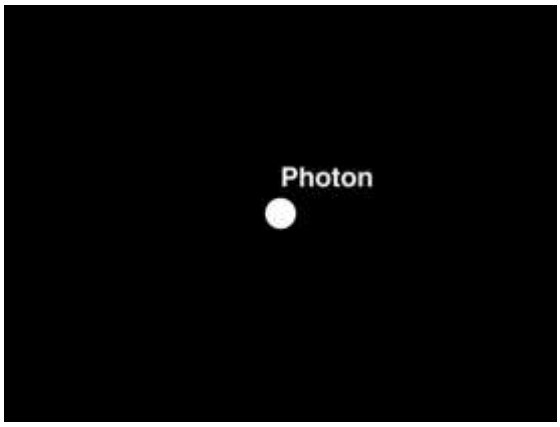


Energy of a photon and shock wave

Concentrated energy

- If you had an instrument that could register any level of concentrated energy (i.e. any light intensity), and you projected one photon at a sensor, then the image you would likely get is shown here.

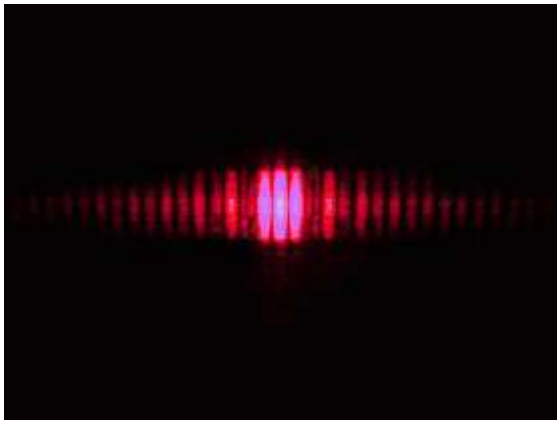
Technically, the term 'light' only applies to an energy concentration that can be observed by the human eye, not the light detected by a sensor.



Light observed by the human eye

Visible light

- If we look at the same image with a human eye, the sensors in the eye will only register the bright light of the photon (or should I say, multiple photons).

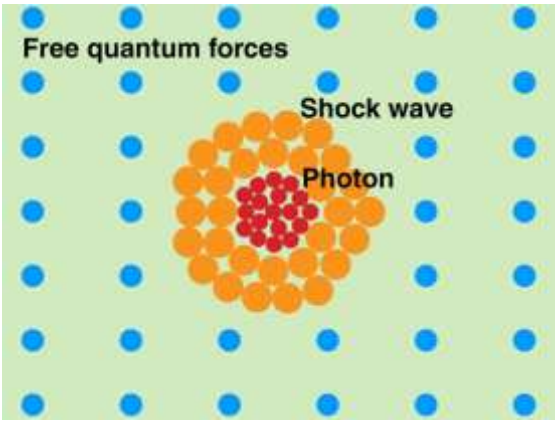


Double slit experiment image

Relative energy

- We can get an idea of the difference in energy between a photon and shock waves when we look at the image generated by the double slit experiment.
- The high intensity light of the photon is visible in the centre.
- The intensity of the shock wave effect adjacent to the photon's mark is much less than the photon.
- Again, note the vertical height of each bar of light.

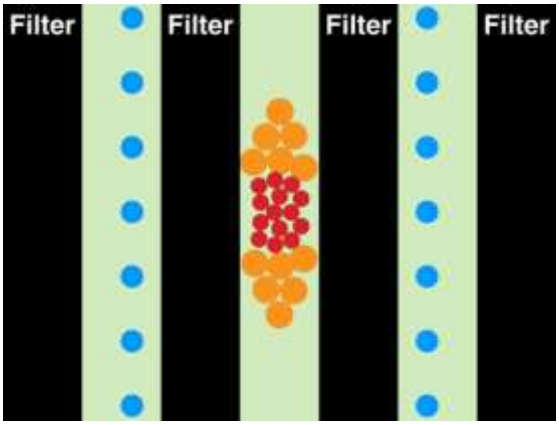
The Triple Filter Experiment



Photon and shock wave (front view)

Building of the shock wave

- As a photon moves, it generates an attached shield of compressed quantum forces, which I have called a 'shock wave'.
- The shock wave is formed from the same compressed quantum forces as the central photon.
- Even though the original photon has a diameter of a fraction of a millimetre, the shock wave can have a diameter that grows to a size of centimetres (as evident by the double slit experiment).



Filtered light (front view)

Passing light through a filter

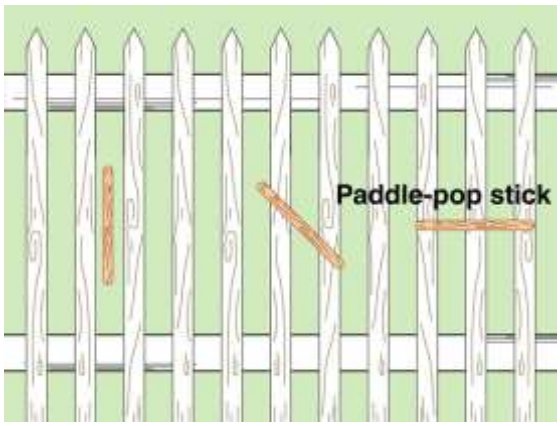
- When a photon and its shock wave pass through a polaroid filter, most of the shock wave is removed from the photon.
- The photon itself will either:
  - pass through one of the gaps
  - impart a force onto atomic particles within the filter, after which the photon will convert back into free quantum forces, or
  - reflect off the filter.

Three overlapping filters

Triple filter experiment

- The triple filter experiment involves passing light through three polaroid filters; each filter rotated 45-degrees from the previous filter.
- Unlike the double filter experiment, which appears to block 100% of the light, the triple filter experiment allows approximately 12% of the light to pass the three filters—the question is: Why?

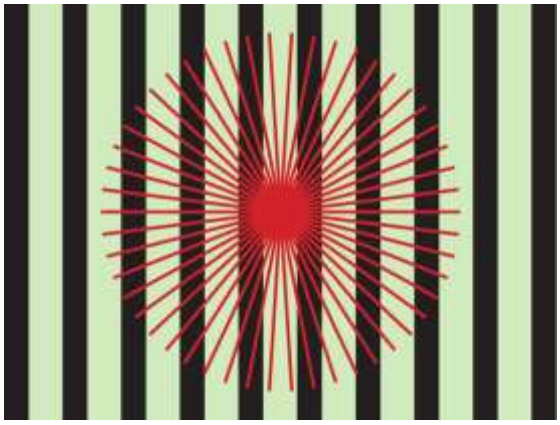
If light were to travel as a transverse wave



Horizontal paddle-pop stick

Introduction

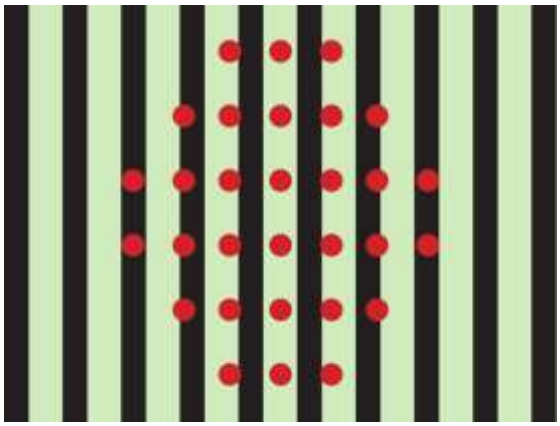
- Some writers have compared the filtering of light to the passing of a paddle-pop stick through a slatted fence.
- I disagree with this analogy because it would suggest that far more than 50% of the light would be filtered, and the filtering would depend on the width of the 'gap' in the filter.
- However, experiment consistently show a 50% reduction in light passing the filter.



Photons arriving in a starburst pattern

Light as a transverse wave

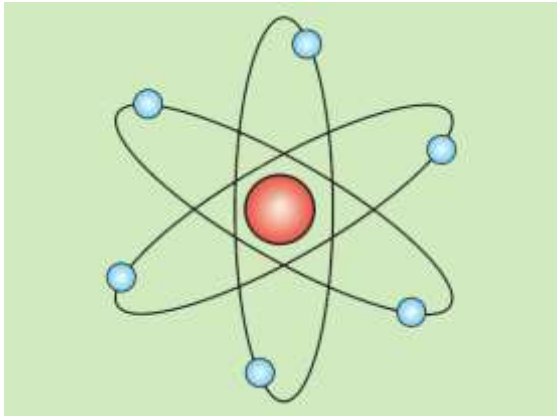
- As this diagram (left) would suggest, if light did travel as a transverse wave, and these waves arrived in a 360-degree spectrum, then it would be reasonable to expect that a polaroid filter would remove more than 50% of the light.



Photons approaching a vertical filter

Light as a compression wave

- If light travelled as a longitudinal compression wave, then it would be reasonable to expect that a polaroid filter would filter around 50% of the light.

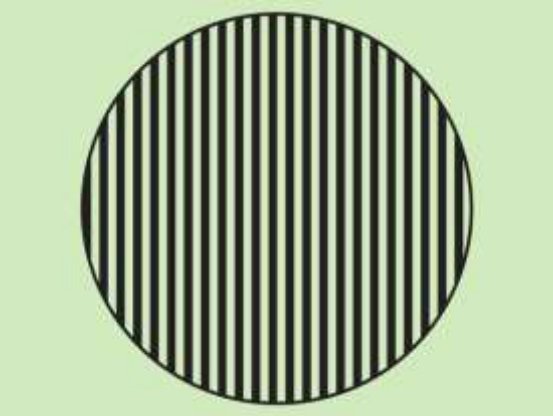


Atom

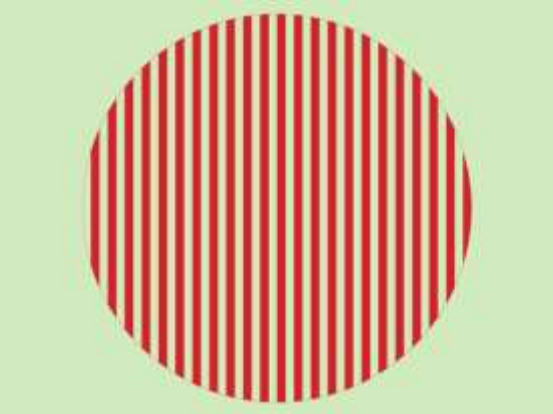
The collapse of divided photons

- If a filter removes a significant portion of an individual photon, then the divided photon will collapse and convert into background aether.
- It is my belief that:
  - an electron is the smallest stable form of matter
  - a 'whole' photon is the smallest stable form of a concentration of quantum forces that has insufficient mass to continue to grow into a form of matter.

Double filter experiment

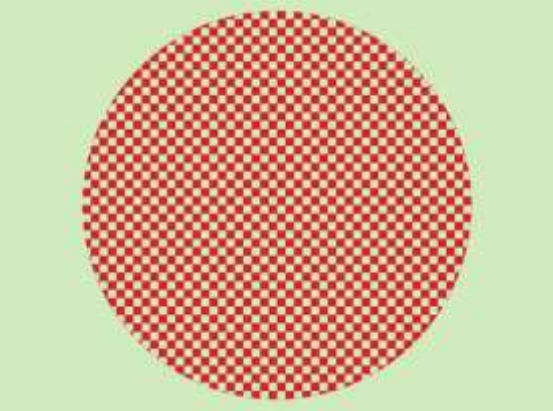


Vertically aligned filter (50%)



Polarised light (shown in red)

Horizontally aligned filter (50%)



Theoretical light passing the filter

Light passing through a vertical filter

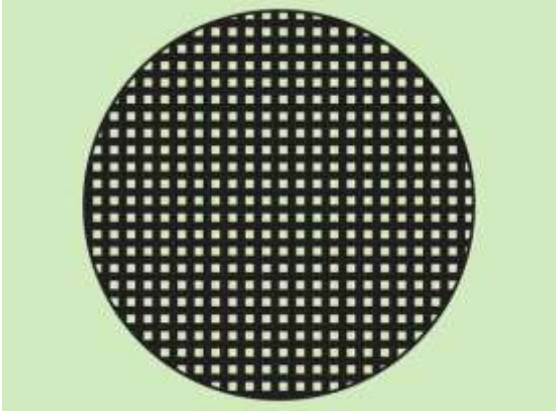
- If we were to send a beam of light towards a polaroid filter, then it would be expected that around 50% of the light will be filtered.
- The image (left) shows a vertically aligned polarised filter.

Note: Some people believe that if two polarised filters are held at 90-degrees to each other, their combined silhouette would present a 100% shadow; not the 75% shadow that actually occurs (refer to bottom image).

Polarised light

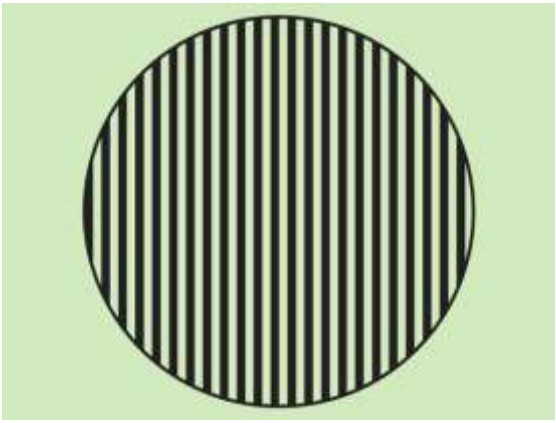
The image shown left, represents the filtered light (shown in 'red') that would pass through a vertical filter.

- If this filtered light were to be projected onto a horizontal filter (below left), then it would be reasonable to expect that the passing light would look something like that shown below (bottom left).
- This theoretical projection of light represents around 25% of the original light.
- However, we know from experiments that two miss-aligned polaroid filters will stop nearly 100% of the light.
- The reason for the near-100% filtering is:
  - each photon that passes through the second filter will lose around 75% of its shock wave
  - after the first filter, the photons will try to rebuild their shock wave
  - however, if this rebuilding process takes too much energy from the photon, then the photon will collapse (i.e. convert into free quantum forces), and the photon will cease to exist.



Combine filters (25% blockage)

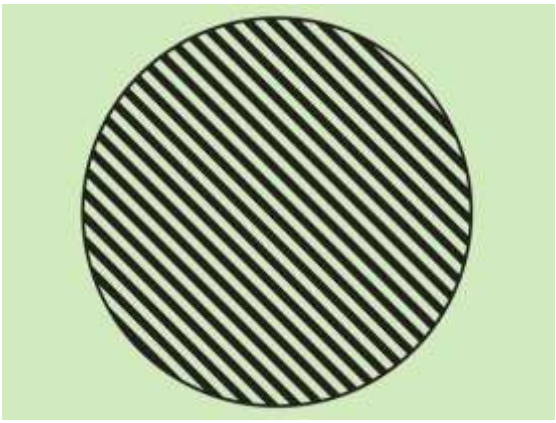
Triple filter experiment



First filter: Vertically polaroid (50%)

First filter

- The triple filter experiment involves passing light through three polaroid filters; each filter rotated 45-degrees from the previous filter.
- Unlike the double filter experiment, which blocks almost 100% of the light, the triple filter experiment shows that approximately 12% of the light is able to pass through the three filters.



Second filter: Tilted polaroid (50%)

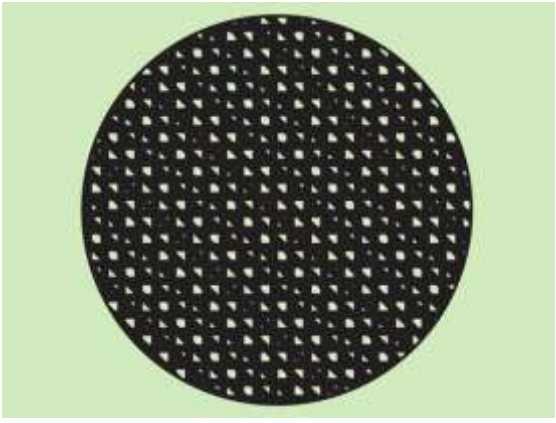
Second filter

- If the first filter is vertical (top left), then the second filter (left) will be at 45 degrees.

Third filter: Horizontally polaroid (50%)

Third filter

- If the first filter is vertical, then the third filter (left) will be horizontal.

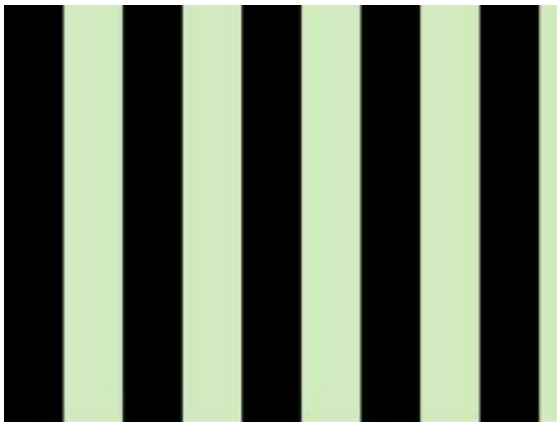


Combined filters (12%)

Image of combined filters

- The net clear area of the three filters is around 12 to 13% depending on the positioning of each filter.
- The conventional theory of light cannot explain this counter-intuitive outcome of around 12% of the light passing through the three filters.
- However, the outcome can be explained by the longitudinal compression wave theory of light that is being proposed within this document.

Explanation of the triple filter experiment



(a) Vertical filter (54%)

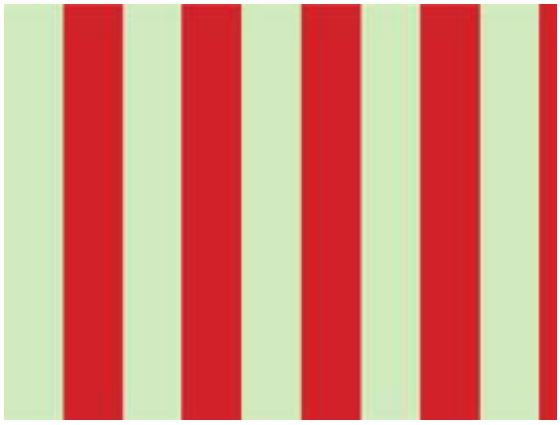
Introduction

The following images represent a magnified view of a polarised filter.

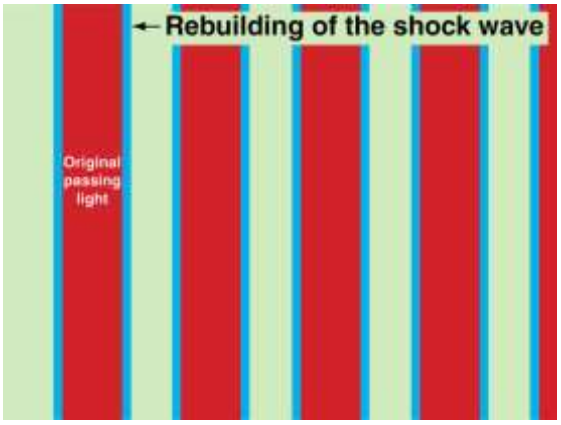
(a) The first image represents the first vertical filter.

(b) The net image represents the light (red) immediately after it passes through the vertical filter.

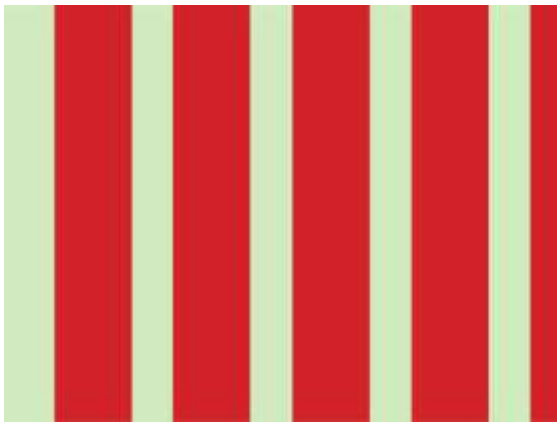
(c) Image (c) represents this filtered light beginning to rebuild its shock wave (blue), which has increased the total light to 61%.



(b) Light passing through filter (46%)



(c) Rebuilding of the shock waves (61%)



(d) Expanded light all shown in red (61%)

Second (tilted) filter

(d) Represents the total light approaching the second filter. This light is the total of the red and blue regions shown in image (c).

(e) Image (e) represents the expanded light shown in (d) as projected onto the second (tilted) filter.

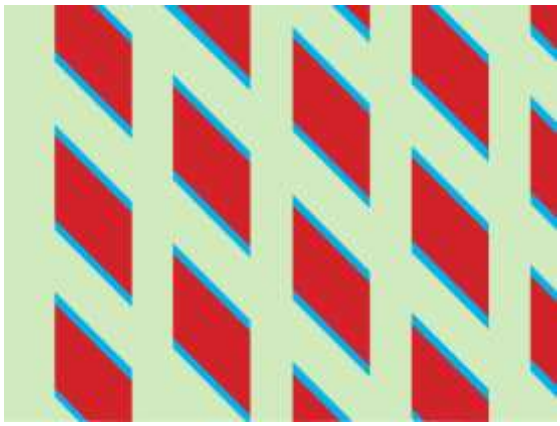
(f) Image (f) represents the amount of light (31%) that is expected to pass through the second filter.

The percentages are only estimates based on an assumed growth of the shock waves.

(e) Light projected onto the second filter

(f) Light passing through the filter (31%)

Explanation of the triple filter experiment



(g) Rebuilding of the shock waves

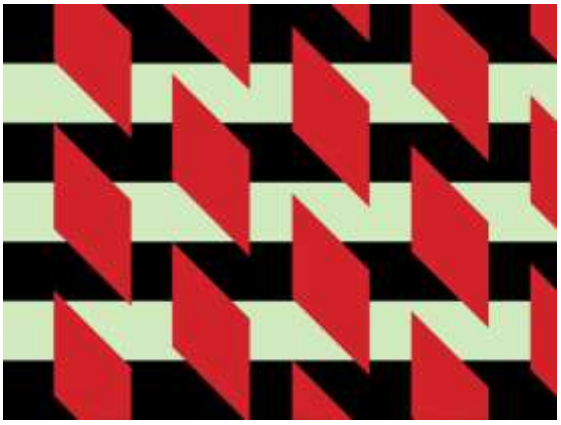
Light passing through the second filter

(g) Image (g) represents the rebuilding of the various shock waves (blue) from 31% (f) to 39% (g), but this is based on my guess as to how rapidly the shock wave is rebuilt.

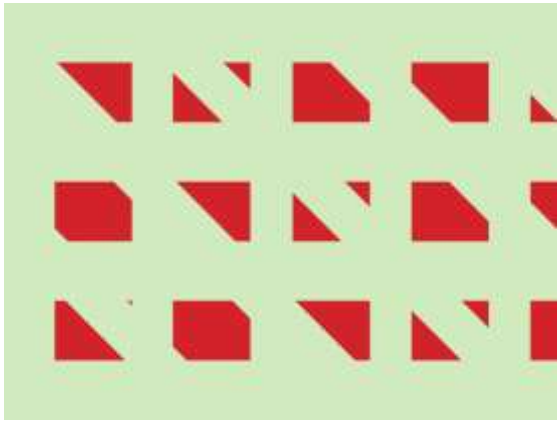
(h) Image (h) represents the total amount of light approaching the third filter. This light is the total of the red and blue regions shown in image (g).

(i) Image (i) Represents the rebuilt light approaching the third and final filter. This final filter is aligned horizontally.

(h) Expanded light all shown in red (39%)



(i) Light projected onto the third filter

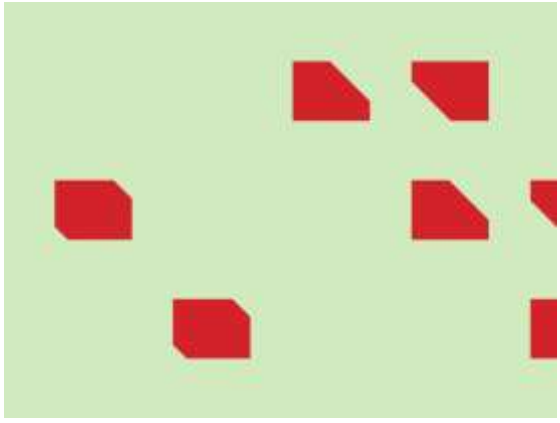


(j) Light passing through the filter (16%)

Light passing through the third filter

(j) Image (j) represents the theoretical amount of light that could pass through the third filter based on 100% blockage by the filter.

(k) Image (k) represents the amount of light (10% in this example) that would likely remain stable, and therefore remain visible. The smaller segments of light would not have the energy to maintain their stability, and thus would return back to being background aether.



(k) Collapse of minor light elements (10%)

Conclusions

- The physics observed here has **nothing** to do with the magical properties of light.
- The mechanics is based on a photon rebuilding its trimmed shock wave, but only along the sides where the shock wave was 'trimmed'.
- This means that the smaller the change in angle from one filter to the next, the greater the potential for the rebuilt shock wave to pass through the next filter, which means the photon has to do less work to rebuild its shock wave.

Things for you to think about

Within this paper I have probably already 'crossed the line' in minds of many people. I have presented too much guesswork, and presented too many unproven conclusions. I know what many people will be thinking: *He has no training in astrophysics. He is not a scientist. Why do engineer even think that they can understand such issues? He is just making it all up in his head.*

Of course, not everything that I have discussed will be correct (probability is not on my side). I don't mind being proven wrong. It wouldn't be the first time that that outcome was achieved. But I do not want errors in some parts of my work to be used as an excuse to reject all of my work.

I have already been accused of 'making this all up in my head'. I find that to be an interesting statement given that every though that every person has ever had was 'made-up in their head'. Obviously, what I see as 'making a logical connection', others see as 'guesswork'.

My aim was not to rewrite all of science, but to demonstrate the advantages of a force-based model of the universe over our current energy-based model.

So, I will end my discussion about 'light' here, but before I do, I would like to leave you with some issues to think about in *light* of the information that I have already provided.

1. Think about the fact that if two polaroid filters are overlapped at 90-degrees, they will only block 75% of the surface area of the filters (not 100%), which means that 25% of the light should pass, but it doesn't. But, nearly 100% of light will pass through a sheet of glass, and there are no holes in that glass that come close to the open holes in that double filter. Why?

   The answer can be found in thinking about how light moves through the field of free and attached quantum forces that surround all particles of matter, and whether or not the physical matter will absorb, reflect, or pass the photon energy.

   [It may be just me, but I think that the fact that light can pass so freely through glass, to be one of the most interesting facts of our universe. Can you imagine what life would be like today if nobody had discovered 'glass'?]

2. Think about how sound waves are able to pass through solid walls, but not through sound-proofing material. Do you really think that the sound waves that come from your voice can vibrate a solid wall. And even if they could vibrate a wall, wouldn't the wall have its own frequency, but when someone speaks in an adjacent room, we can usually tell who is speaking because of the frequency of their voice.

   And, why is it that placing an empty glass up against the wall will help to amplify the sound, when it should help to reduce the vibration of the wall? Of course, the answer is that it has nothing to do with the vibration of the wall. So how does sound move through a solid wall? Hint: the answer is almost identical to the answer to question 1.

3. If I am correct in my explanation of the movement of photons, then what causes a change in properties of light after it has reflected off a surface (i.e. when light reflects off snow)?

4. And, if I am correct in my explanation of the movement of photons, then how does a head-up display work on your car windscreen such that the reflected image will now be blocked by polaroid sunglasses?

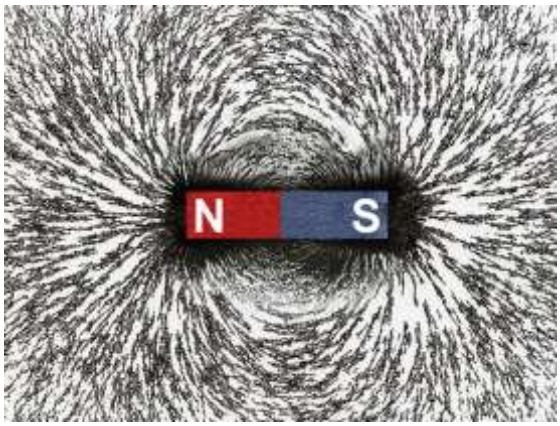
5. Why is a photon of light <u>not</u> surrounded by 'attached' quantum forces?

6. Think about the physics that allows 'space' to behave like a superfluid. To simply say that 'space' behaves like a superfluid (which is what I have done in this paper) is trusting in magic. What I should have done would have been to describe how the properties of 'space' allow it to behave like a frictionless superfluid, and allows light to travel for light-years with minimal loss of energy—that would have been true physics.

7. The real test would be to use the force-based model to describe the outcomes from each of the test performed at CERN.

10. Magnetism and Electricity

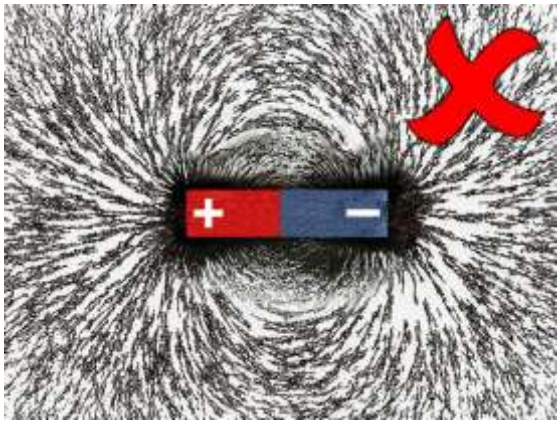
Introduction



Magnetism

Introduction

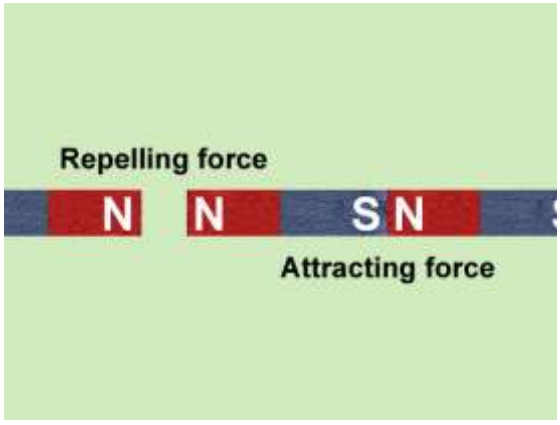
- Most issues in astrophysics can be understood with just the knowledge gained from high school physics.
- In this chapter I plan to use high school physics to explain:
  - what causes magnetism
  - what allows electricity to generate a magnetic field
  - what created Earth's magnetic field
  - what causes the Earth to spin.



No positive or negative effects

No more positive and negative charges

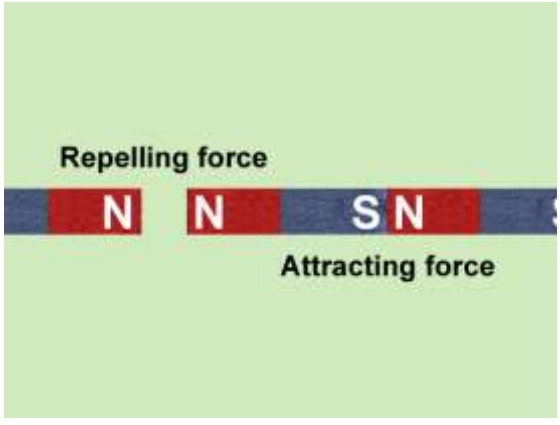
- In order to correctly discuss magnetism, we first need to remove all mention of positive (+) and negative (-) charges.
- Surprise, surprise, magnetism has **nothing** to do with charged particles.
- The concept of charged particles was **invented** as a means of describing the forces that hold electrons in orbit around a nucleus, but this explanation (in my opinion) is wrong, and should be discontinued (refer to Chapter 12).



The 'assumed' magnetic forces

An invented force

- Electromagnetism is said to be one of the four fundamental interactions because this action could not be explained in terms of the other known interactions.
- Magnetism appears to incorporate both 'repelling' and 'attracting' forces.
- However, the action that causes the apparent repelling force is identical to the action that causes the attracting force—and both actions can be explained through the actions of quantum forces.

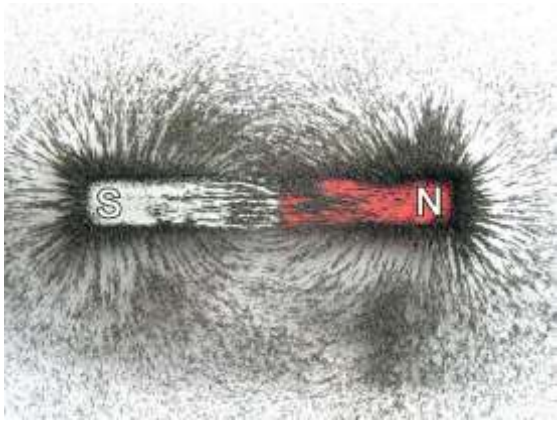


Assumed magnetic forces

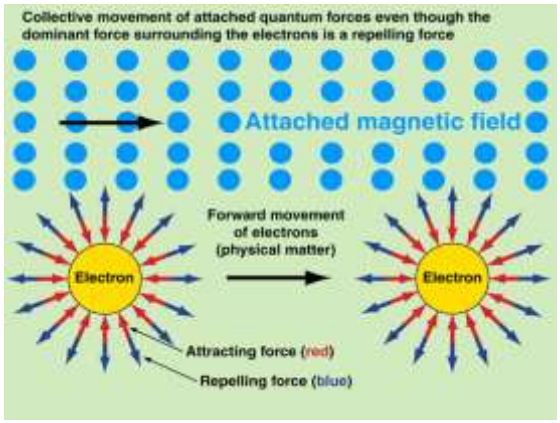
The force of magnetism

- This chapter will demonstrate how the actions of magnetism can be explained using a force-based model of the universe.
- If correct, this will mean that:
  - there is no need to label particles as being positive or negative, and
  - electricity is not caused by the movement of 'charged' particles
- However, we can continue to use the term 'magnetism' even if we stop referring to positive and negative charged particles.

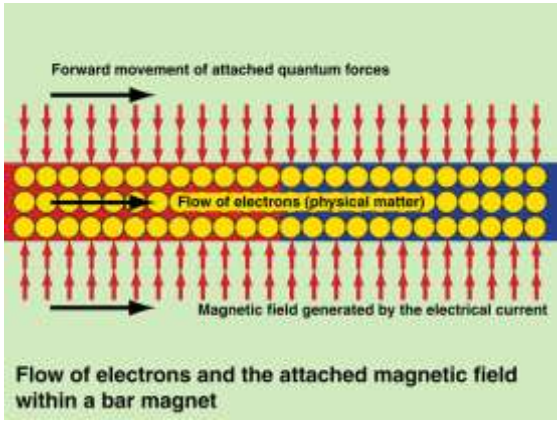
Magnetism and quantum forces



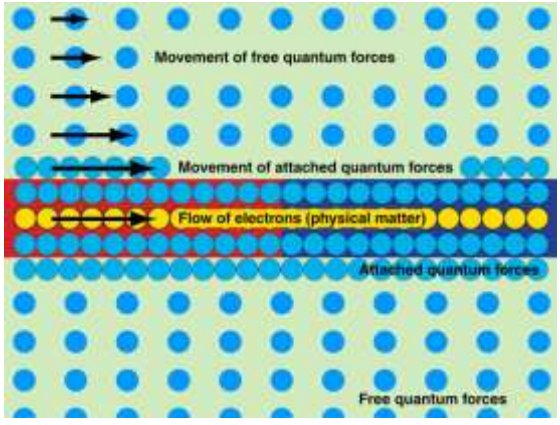
Bar magnet



Electrons moving the magnetic field



Quantum forces attached to electricity



Quantum forces now shown in 'blue'

Magnetism

- The quantum force model suggests that magnetism is generated by the movement of free or attached quantum forces.
- In the quantum force model of the universe:
  - magnetism is generated by the flow of free or attached quantum forces
  - electricity is generated by the flow of concentrated quantum force (i.e. matter), and
  - heat is a measure of the concentration of free and attached quantum forces.

Attached quantum forces

- An electron is formed from a concentration of quantum forces, and it is the smallest stable concentration of quantum forces.
- The quantum forces that surround an electron all push against the electron causing it to adopt a spherical shape.
- The force exerted by each of the surrounding quantum forces is so strong that it causes these forces to remain attached to the electron.

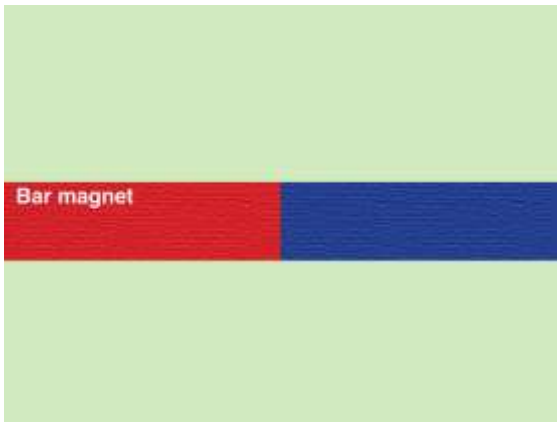
Movement of attached quantum forces

- When electrons move along an electrical wire, the attached quantum forces move with the electrons, both inside and outside of the wire.
- Quantum forces (shown as red arrows) are significantly smaller than the electrons.
- Because quantum forces are attached to all electrons, these forces exist throughout all physical matter, including electrical wire, electrical insulation, and humans.

Movement of travelling quantum forces

- Free quantum forces exist throughout space, as well as within physical matter.
- When electrons move, they cause the direct movement of attached quantum forces, which creates a magnetic field.
- When attached quantum forces move, they induce the movement of some of the surrounding the free quantum forces, which contributes to the width of the magnetic field; however, this process can be altered by the presence of insulation.

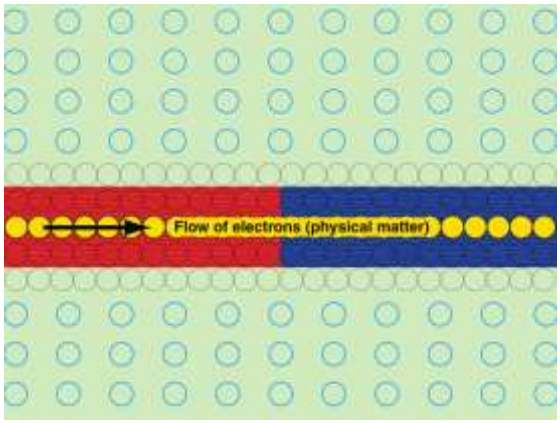
The induced movement of attached and free quantum forces



Bar magnet

Introduction

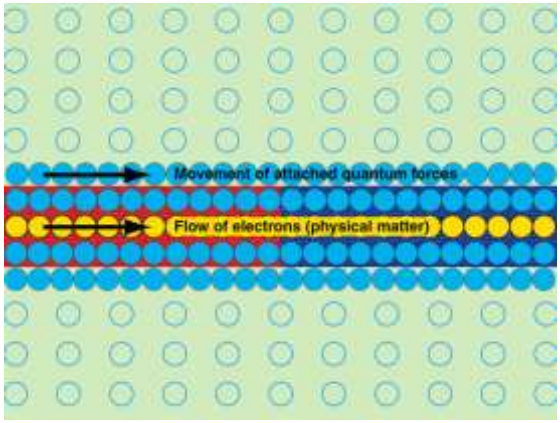
- The key to understanding the mechanics of a bar magnet and the associated movement of quantum forces, is to understand the various interactions between physical matter and quantum forces.
- The following discussion refers to the mechanics of a simple bar magnet.



Flow of electrons

The movement of electrons

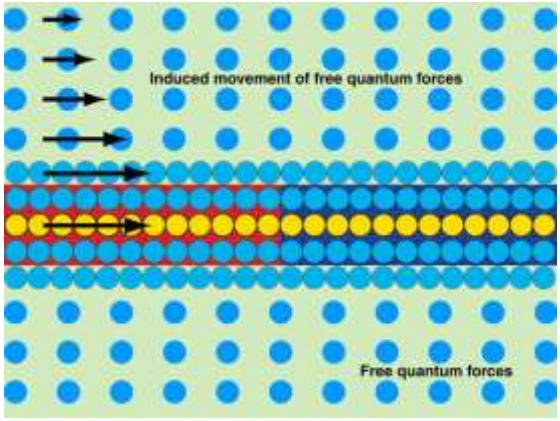
- In order to operate as a bar magnet, the atoms must be arranged (aligned) in a manner that allows the easy flow (transfer) of electrons in one direction along the bar magnet.
- However, there must be a return flow of electrons.
- This return flow of electrons (i.e. movement in the other direction along the metal bar) must be chaotic.



Direct movement of attached Qforces

The movement of attached quantum forces

- The movement of electrons causes a similar movement of all the quantum forces that are attached to those electrons (attached quantum forces).
- This means there is an organised flow of attached quantum forces in one direction, but a chaotic, random-like, return flow of attached quantum forces in the other direction.

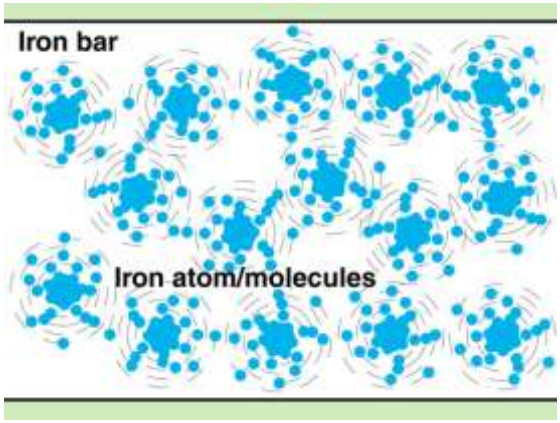


Induced movement of free Qforces

The induced movement of free quantum forces

- The movement of the attached quantum forces induces a similar movement of free quantum forces.
- It is the movement of these free quantum forces that forms the magnetic field around the bar magnet.
- It is also the movement of free quantum forces that forms the magnetic field around the Earth.

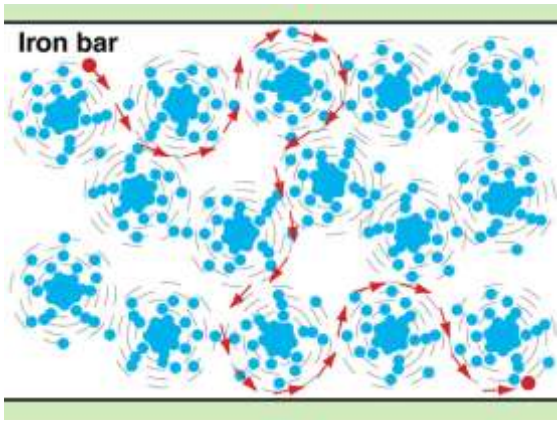
The mechanics inside a bar magnet



Random iron atoms in an iron bar

Introduction

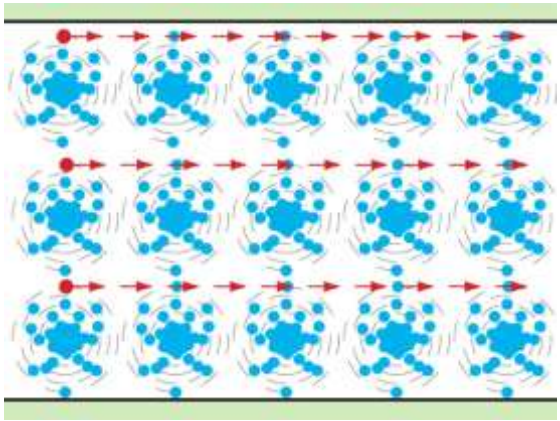
- The potential electrical and/or magnetic properties of a metal bar depends on the atomic structure of the metal.
- When I use of the term 'structure', I mean both:
  - the structure of the atom with regards to the electrons in the outer shell, and
  - the alignment of the atoms.



Random movement of an electron

The movement of free electrons

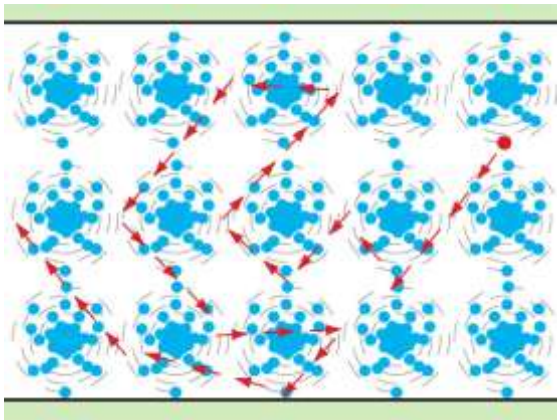
- In some materials, the electrons held in the outer most shell of the atom can jump freely from atom to atom.
- These electrons, like all matter, will travel with some attached quantum forces.
- As the electrons move, the corresponding movement of the attached quantum forces will cause movement of the free quantum forces; but, if this movement is random, then there is no net movement of free or attached quantum forces.



The forward movement of electrons

The movement of electrons in a given direction

- Atoms in a magnetic material can be aligned such that the flow of electrons in one particular direction is well organised.
- The 'energy' for the magnet comes from the momentum of the electrons, but what initiates the magnetic field is the movement of the quantum forces that are attached to the electrons.

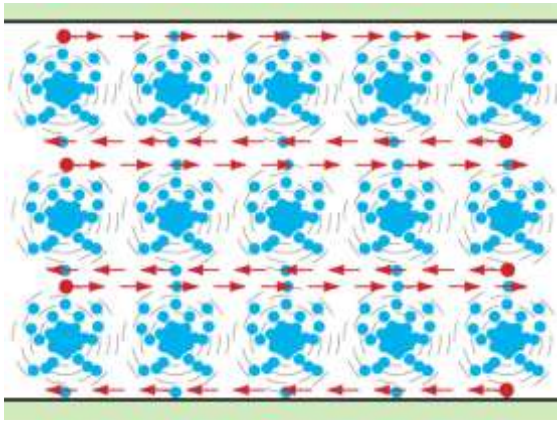


The return movement of electrons

The return movement of electrons

- Within magnetic materials, the alignment of the atoms generates a 'straight forward' movement of electrons in one direction, but the return journey for the electrons must be complex and random.
- Attached quantum forces will travel with the electrons in both directions, but in one direction the flow of quantum forces is well organised, while in the return direction the random movement of the electrons and their attached quantum force will not generate a flow of free quantum forces.

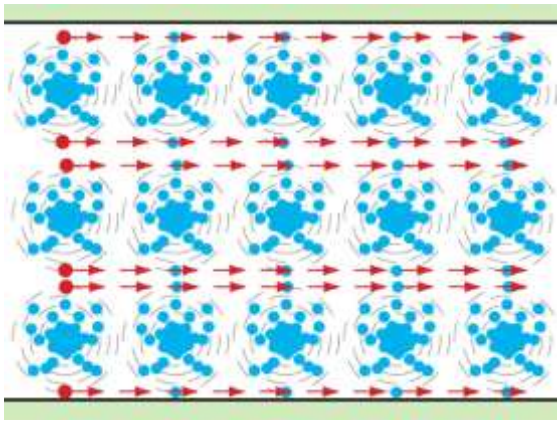
Different types of electron movement



A metal <u>not</u> conducting electricity

Metal type #1

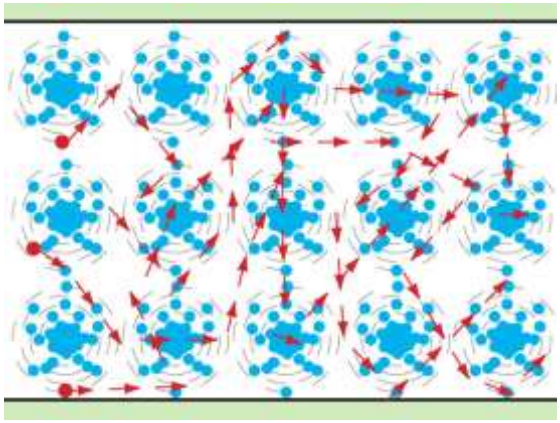
- In such a metal the movement of attached quantum forces in one direction is cancelled by the movement of attached quantum forces in the opposite direction.
- Such a material cannot be magnetised, even though it may be a good conductor of electricity.
- This diagram shows the metal while it is <u>not</u> conducting electricity.



A metal conducting electricity

Metal type #1

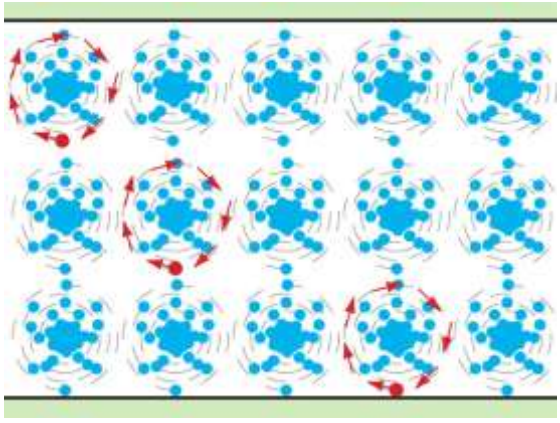
- This diagram shows the above metal type while it is conducting electricity.



Non-conductor, non-magnetic

Metal type #2

- The metal shown here would be both non-magnetic, and a poor conductor of electricity.



Non-conductor, non-magnetic

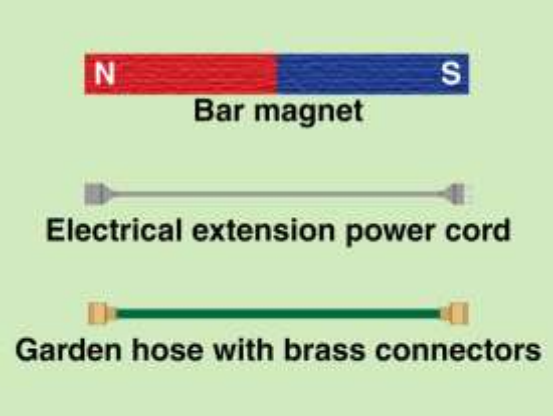
Metal type #3

- The metal shown here would also be non-magnetic, and a poor conductor of electricity.

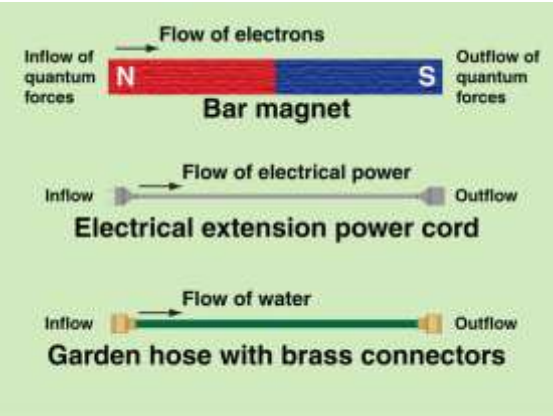
The property of magnetism is all about how electrons are able to flow along the material, which is why only certain material can display magnetic properties.

Running electricity through a potentially metallic metal is just one way of causing the atoms to align correctly.

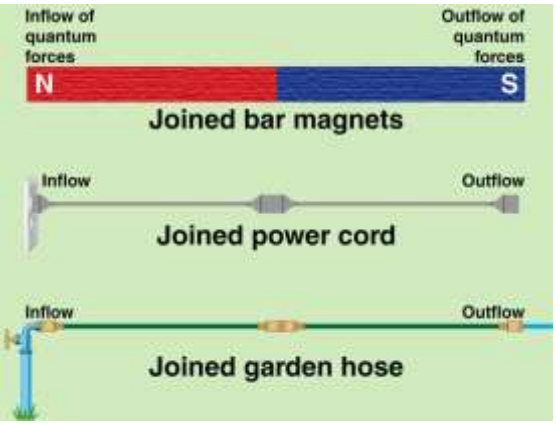
Joining magnets (this shows how an 'engineer' thinks about issues)



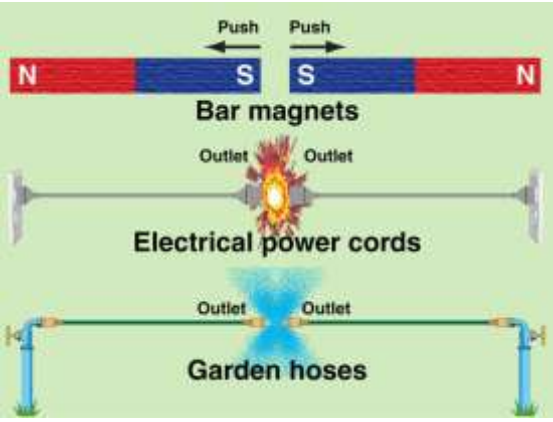
Bar magnet, power cord and garden hose



Magnet, power cord and garden hose



Joining magnets, power cords and hoses



Joining the 'wrong' ends!

Introduction

- If it is accepted that magnetism is the flow of non-concentrated quantum forces, and that the movement of these quantum forces is caused by the movement of electrons, then:
  - the positive end of a bar magnet can be seen as the outflow point of quantum forces (based on conventional flow)
  - the negative end of a bar magnet can be seen as the inflow point, and
  - a bar magnet can be compared to an electrical power cord, or garden hose.

Magnets are just a conduit of flow

- Instead of labelling the ends of a bar magnet as positive (+) and negative (-), they could be labelled the *inlet* and the *outlet*, like on a garden hole.
- What flows into and out of a magnet are free quantum forces.
- Similarly, what flows into and out of an electric power cord are electrons.
- And, what flows into and out of a garden hose is water.

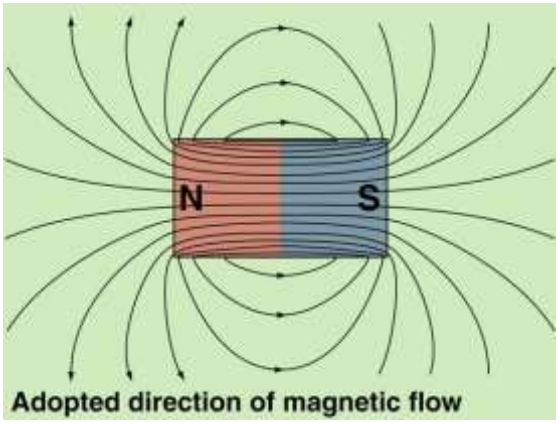
Joining two magnets

- When two electrical power cords are joined, what was previously the outlet of one cord is joined to the inlet end of another power cord.
- The junction of the two power cords is no longer an inlet, nor an outlet, but just apart of the now longer power cord.
- The same outcome occurs if two garden hoses are joined.
- Similarly, the joining of two bar magnets just produces a longer bar magnet.

Joining the 'wrong' ends

- Power cords are designed such that it is not possible to join two power inlets, or two power outlets.
- Garden holes are multi-directional; however, problems will arise if someone attempts to join the active outlets of two garden hoses.
- Similarly, significant resistance will arise if someone attempts to join the outlet (positive) ends of two bar magnets.

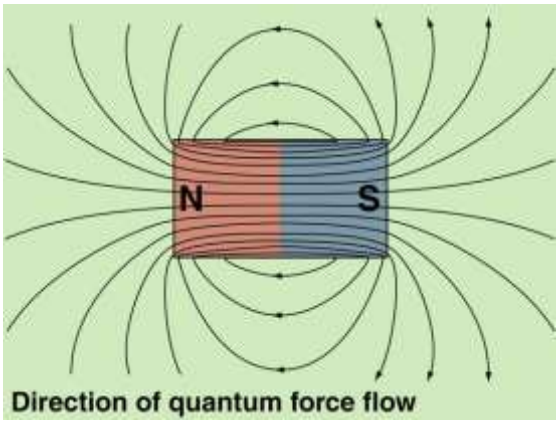
The mechanics of a magnet's repelling force



Direction of +ve flow by convention

Direction of current based on the movement of a positive ion

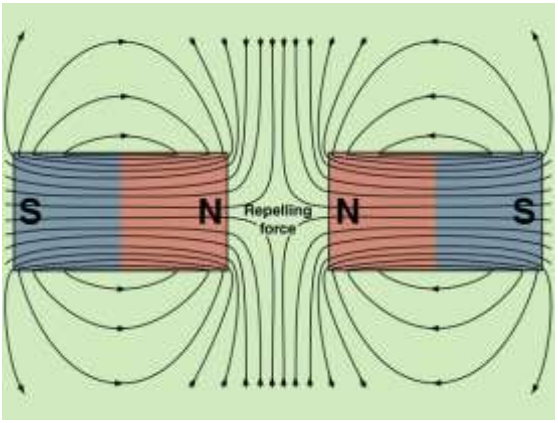
- Technically it is incorrect to say that the magnetic flow is from the north to south end, or vice versa, because the magnetic flow is a closed circuit, which means quantum forces travel from the north to the south, and from the south to the north.
- But at some stages the flow is inside the magnet, while at other stages the flow is outside the magnet.
- Convention states that the flow is from north to south, or from +ve to -ve.



Actual direction of flow of quantum forces

Direction of electron and quantum force movement

- The actual external flow of quantum forces is from south to north, or from the negative end to the positive end.
- The actual internal flow of quantum forces is from north to south, or from the positive end to the negative end.

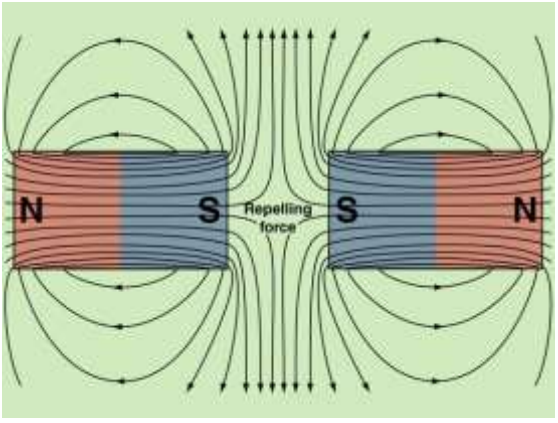


Two adjacent northern (positive) ends

The cause of the repelling force (+ve ends)

- A strong repelling force is generated when two positive ends are placed next to each other.
- What everybody should notice is how easily the magnets desire to move laterally—it is almost like the magnets want to move sideways.
- This lateral movement is even stronger than the forces generated when to water jets are aimed towards each other.

This 'desired' lateral movement is very important, especially for electric motors.



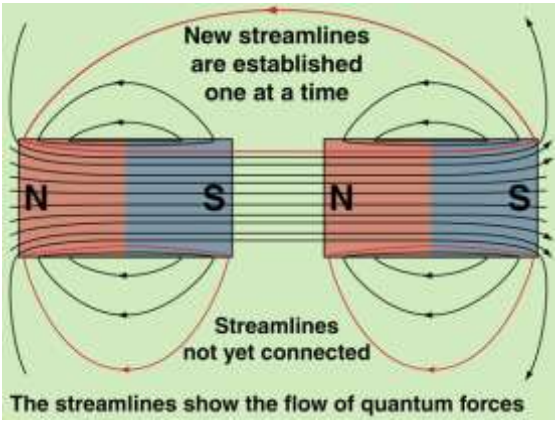
Two adjacent southern (negative) ends

The cause of the repelling force (-ve ends)

- A similar strong repelling force is generated when two negative ends are placed next to each other.

In the diagrams I have labelled the magnets north (N) and south (S) because I am uncomfortable with the terminology of 'positive' and 'negative'.

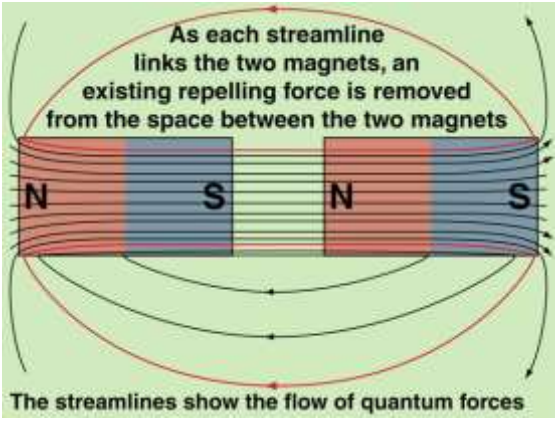
The mechanics of a magnet's apparent 'attracting' force



Actual quantum force flow

Shifting of the magnetic streamlines

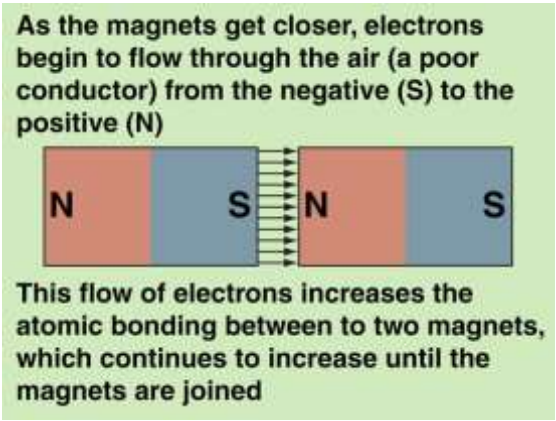
- Joining the north end to the south end allows new 'links' to form, and causes an attraction force.
- It has **nothing** to do with positive (+ve) and negative (-ve) attraction.



Actual quantum force flow

Removal of repelling forces from between the magnets

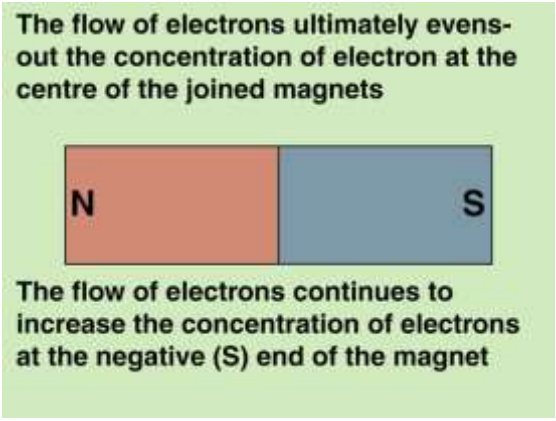
- Removing two magnets from each other requires energy in order to break the magnetic connections.



Actual quantum force flow

Electrons passing from magnet to magnet

- As the magnets get closer together, electrons can begin to flow between the magnets, along with their attached quantum forces.

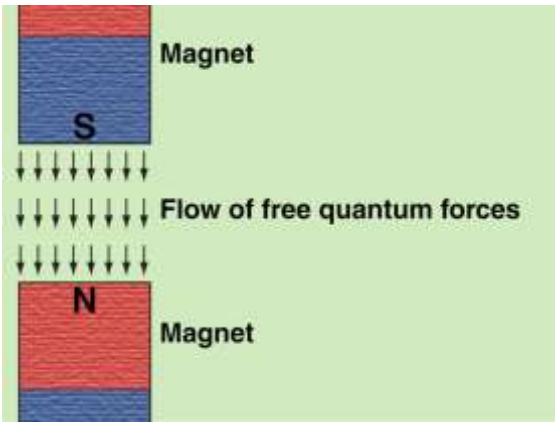


Joined magnet

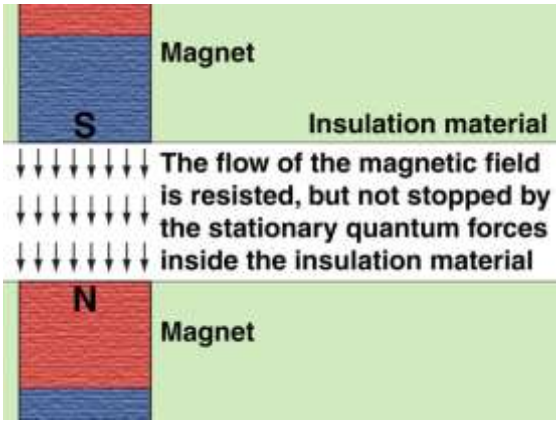
Growth of atomic bonds

- Once joined, the flow of electrons continues to increase the concentration of electrons at the southern end.

The mechanics of magnetic flow through insulation material



Electrical flow in an insulated conductor



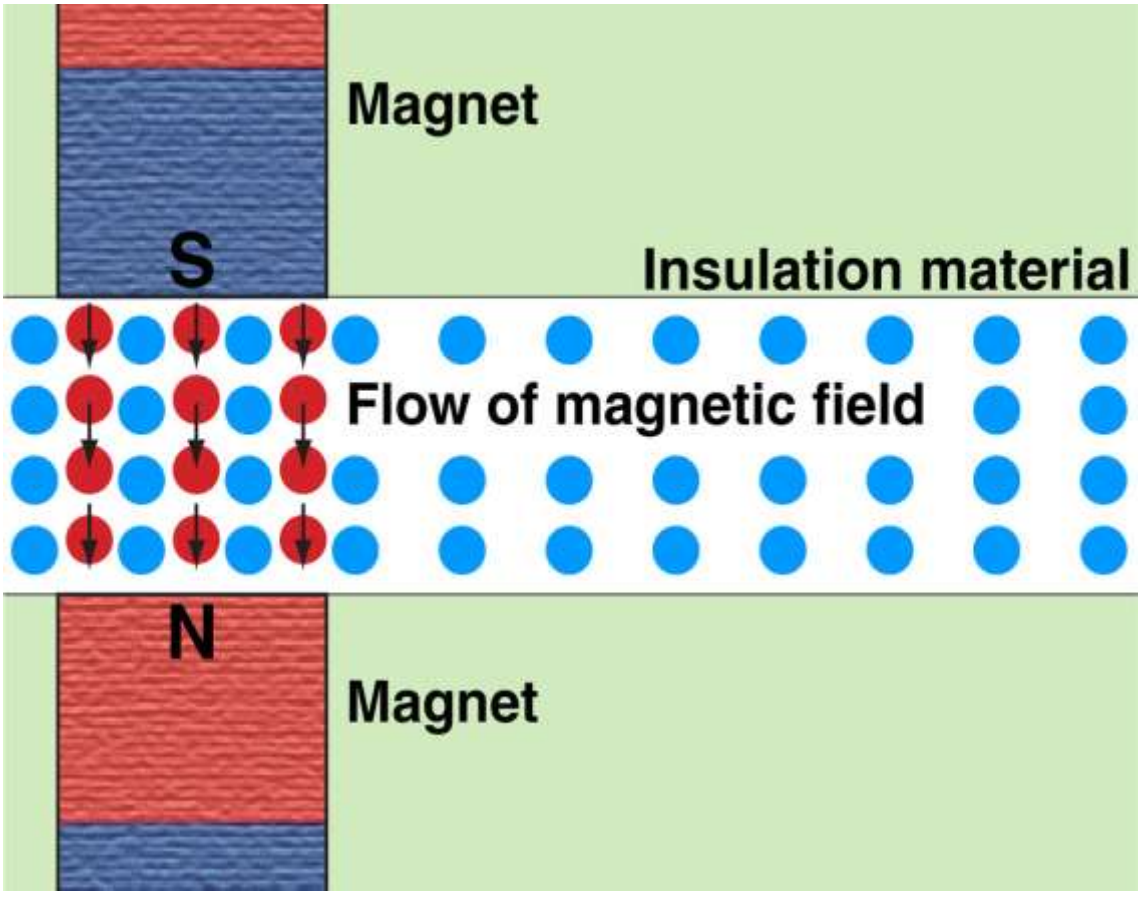
Flow of free quantum forces

Insulated electrical wires

- When an electrical wire is insulated, the electrons within the insulation material are resistant to any form of movement, which means their attached quantum forces will also resist any form of movement.
- Even though insulation material will contain free quantum forces, these quantum forces will not freely respond to the movement of the quantum forces in the wire because of the stationary quantum forces attached to the electrons within the insulation material.

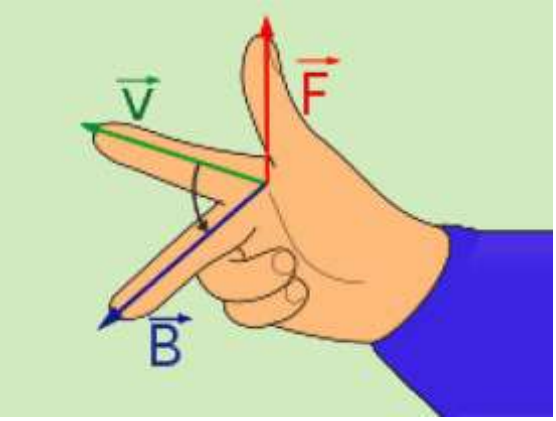
Magnetic flow through insulation

- Insulation material will, however, allow limited magnetic flow to occur through the material.
- A bar magnet held on one side of a sheet of insulation can induce the movement of another bar magnet on the other side.
- This is because the magnet passes its own flow of free quantum forces through the insulation.
- The insulation resists this movement, but cannot stop it, but the thickness of the insulation does become a factor.

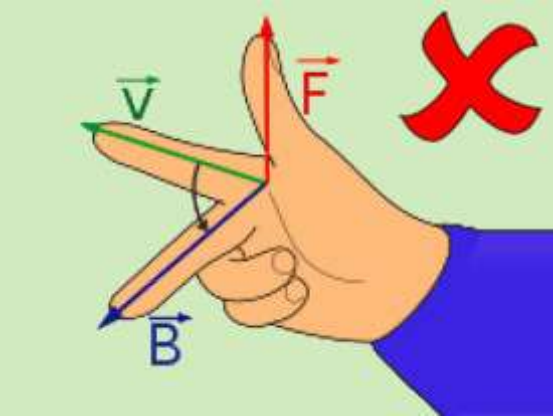


Magnetic flow through a sheet of insulation material

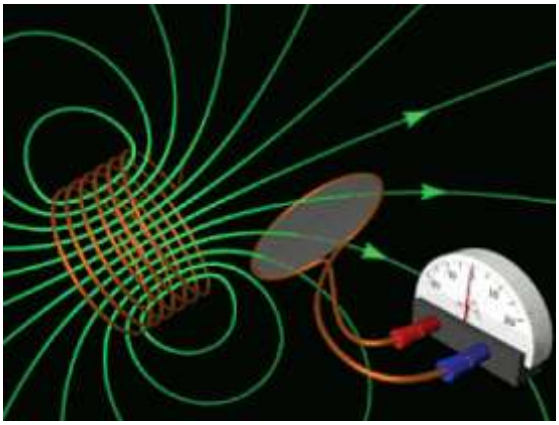
The rules of conventional flow vs actual flow (this stuff hurts my head!)



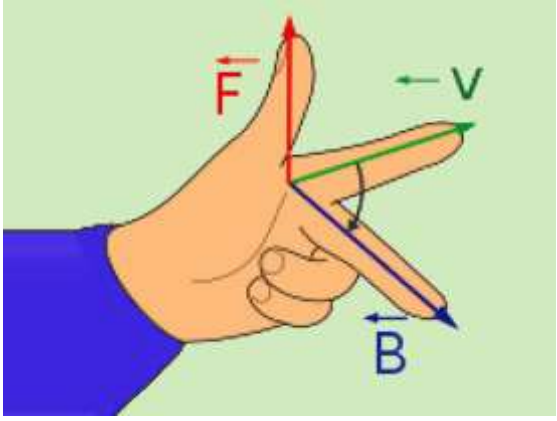
The right-hand rule (Wikipedia)



When rules don't apply



Electrical current



The left-hand rule

The right-hand rule

- As I stated at the beginning of this document, electromagnetics is not my field of study, so I am easily confused.
- Speaking of confusing; I love how the left-hand rule for electric motors becomes the right-hand rule for generators (?).

Using the right hand, pointing the thumb in the direction of the current, and the fingers in the direction of the magnetic field, the resulting force on the charge points outwards from the palm.

My problem

- Whichever hand and choice of axis you use, the rule does not always apply as stated.
- If the shaft is rotating slower than the 'equilibrium rotation', i.e. then the applied force is in balance with the force of resistance (friction), and the right-hand rule applies.
- However, if the shaft is rotating faster than the 'equilibrium rotation', then the direction of the force is reversed, and the left-hand rule applies.

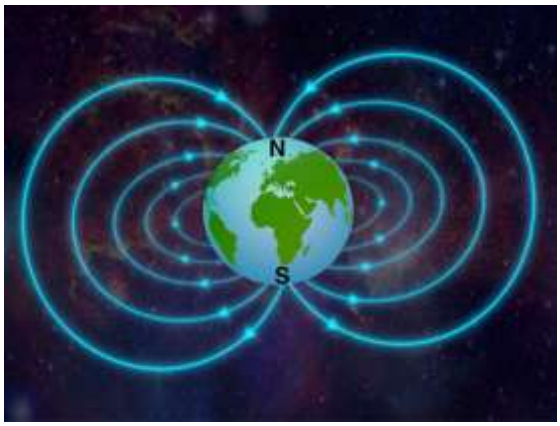
Faraday's law

- Electromagnetic or magnetic induction is the production of an electromotive force (emf) across an electrical conductor in a changing magnetic field.
- Lenz's law describes the direction of the induced field.
- Faraday's law was later generalised to become the Maxwell–Faraday equation, one of the four Maxwell equations in his theory of electromagnetism.

Conventional flow vs actual flow

- It is conventional in electronics to assume the electrical flow is from the positive to the negative, known as the conventional flow.
- However, it is known that the actual flow of electrons is the reverse—the flow is from the negative to the positive.
- What this means is that if you were to study the actual flow of quantum forces, then the 'right-hand rule' now becomes the 'left-hand rule'—confused?

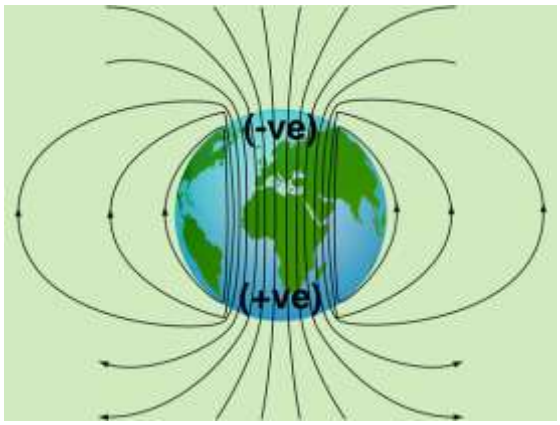
Earth's magnetic field



Common representation of Earth's magnetic field

Current theory of Earth's magnetic field

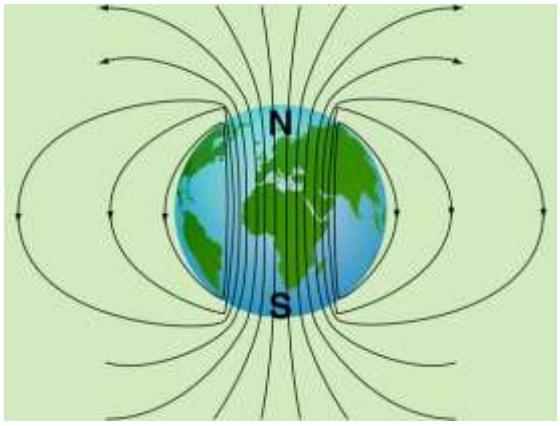
- In 2024, Wikipedia stated that:
  - *'The magnetic field is generated by electric currents due to the motion of convection currents of a mixture of molten iron and nickel in Earth's outer core: these convection currents are caused by heat escaping from the core, a natural process called a geodynamo.'*
- I am in no position to disagree with this statement.



Conventional direction of magnetic flow

The Earth acting as a large magnet

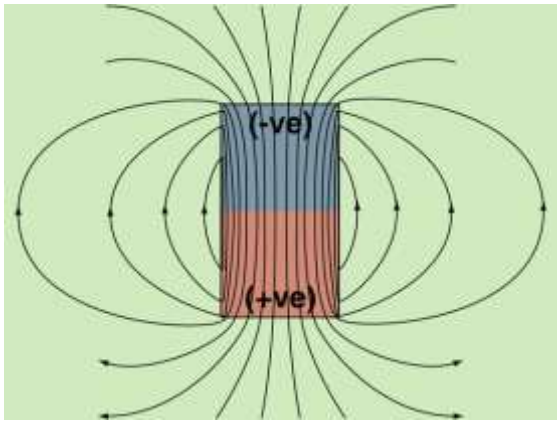
- If the Earth were a bar magnet, then Earth's North magnetic pole would represent the negative end of the magnet.
- This is because a free spinning bar magnet held on the surface of the Earth will rotate such that the positive end of the magnet will point towards the North magnetic pole, and we know that the positive end of a magnet always points to the negative end of another magnet; so, Earth's North pole is the negative end of the Earth magnet.



Actual movement of quantum forces

Actual flow of travelling quantum forces

- The position of the North and South magnetic poles, relative to Earth's rotational axis, can vary over a geological time scale.
- The magnetic poles can also reverse, with the North magnetic pole becoming the positive end of Earth's magnetic core.
- Just like a traditional magnet, the external flow of quantum forces outside the Earth is from the negative end (North pole) to the positive end (South pole).

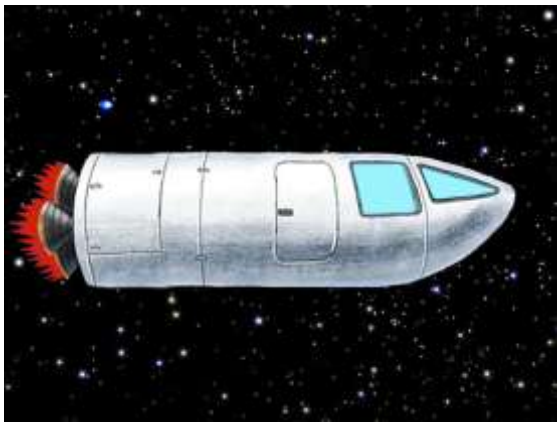


Conventional direction of magnetic flow

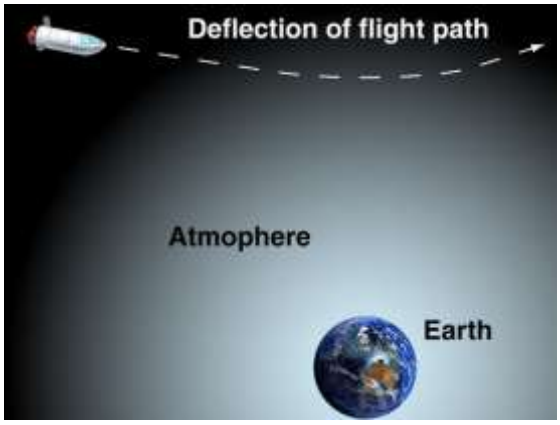
Traditional magnet

- Convention suggests that the magnetic flow (outside a magnet) is from positive (+ve) to negative (-ve), as shown here.
- This means that based on conventional flow, the North pole of the Earth should be referred to as the negative pole.
- However, the actual flow of quantum forces outside a magnet is the same as that for the Earth, which is from the negative to the positive (the opposite of what is shown here).

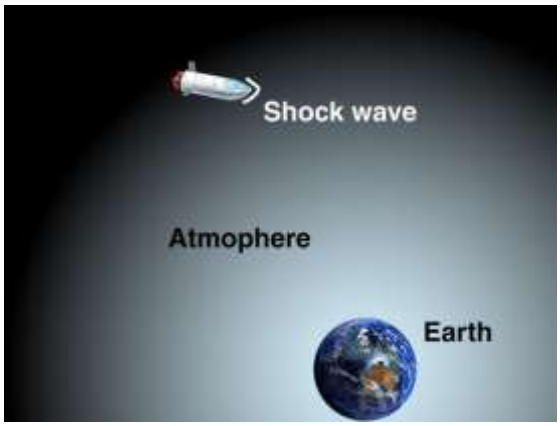
The reason why space craft ‘bounce’ off Earth’s magnetic field



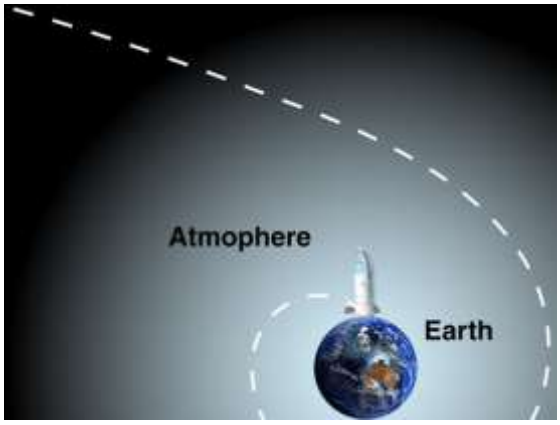
Returning spacecraft



Bouncing off Earth’s atmosphere(?)



Generated shock wave



Return flight

Introduction

- In the Foreword of this paper I asked several questions, I should also ask:
  - Why do you believe that a returning spacecraft can be deflected by Earth’s incredibly thin atmosphere?
- Well, what is your answer?
- Why do you believe that such an outcome is possible?
- Maybe such a deflection is possible, but maybe it has nothing to do with the Earth’s atmosphere?

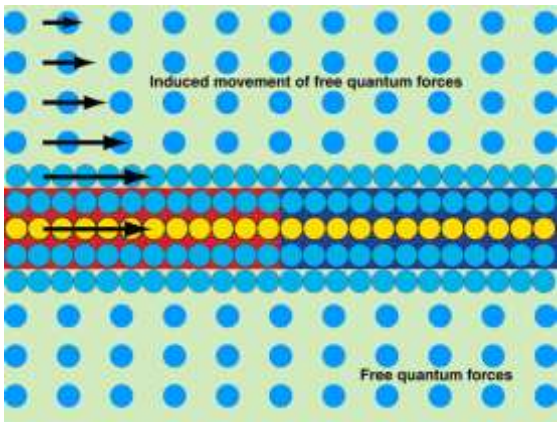
What reasoning could be given to justify Earth’s atmosphere as being the cause?

- I am sure that many would suggest that a spacecraft would be deflected by the Earth’s atmosphere because:
  - the spacecraft arrives at a velocity of 25,000 m/s, or that
  - upon hitting the atmosphere, the spacecraft would experience a greater resistance force on the side of the spacecraft that faces the air of greater density.

My problem with the ‘above’ explanation

- If I were to apply fluid mechanics to this situation, I would note the following:
  - the spacecraft is travelling at supercritical velocity
  - arrival of the spacecraft would generate a shock wave which would compress the air and thus generate heat
  - because of the supercritical velocity, no air ahead of the shock wave will experience any response, so the resistance force of the shock wave would be uniform across the spacecraft
  - therefore, the existence of a greater air mass between the spacecraft and the Earth cannot play any role in the physics, also
  - the variation in air density across the width of the spacecraft would be insignificant, and unable to have any influence over the forces being applied to the spacecraft.
- **In conclusion:** fluid mechanics tells us that the Earth’s atmosphere would not contribute to the deflection of a returning spacecraft.

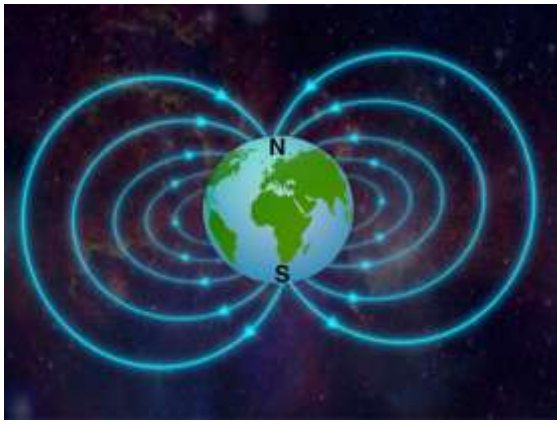
The work done by Earth's magnetic field



The movement of quantum forces

Introduction

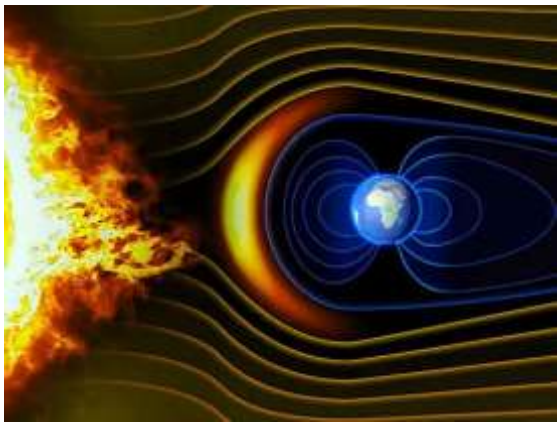
- So far, we have only discussed the movement of matter (electrons) causing the movement of attached quantum forces, which can induce the movement of free quantum forces.
- However, in an electric motor it is the moving electrons the move quantum forces (a magnetic field), that move other quantum forces (another magnetic field), that move physical matter (the drive shaft).



Earth's magnetic field

Earth's magnetic field

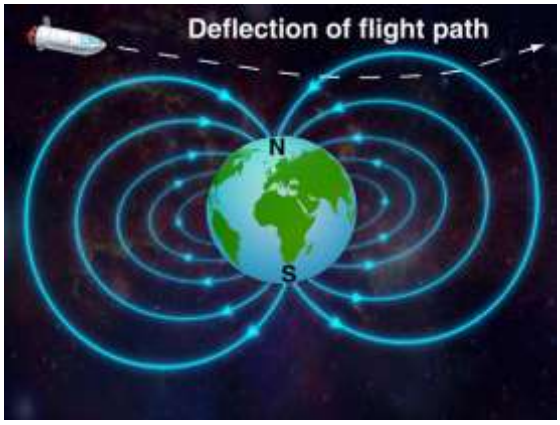
- In the case of the Earth's magnetic field, it is the movement of the magnetic core, that moves attached quantum forces, that moves free quantum forces (Qforces), that circulate through the Earth and then around the Earth to form the magnetic field.
- It is important to note that:
  - free Qforces, attached Qforces and matter are all formed from Qforces
  - each Qforce can move the other Qforces (quantum forces).



Deflection of solar winds

Solar winds

- Numerous publications state that solar winds consist of charged particles, which are deflected by Earth's magnetic field.
- However, the reality is that there is no 'charge' to any of these particles.
- The solar winds are simply compression waves of free quantum forces.
- These quantum forces are deflected by Earth's magnetic field, which is formed from the same quantum forces.

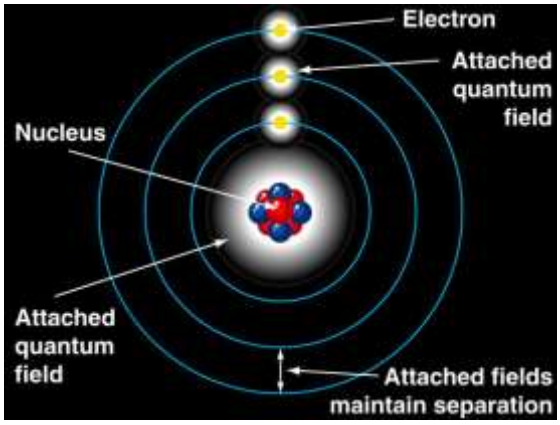


Deflection of returning spacecraft

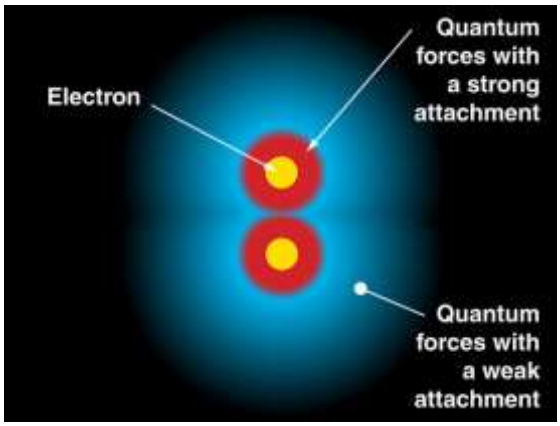
Deflection of returning spacecraft

- It is the author's opinion (and it is just an opinion), that returning spacecraft can be deflected by Earth's magnetic field, in the same way that solar winds are deflected.
- I do not believe that the Earth's atmosphere could generate the required forces.

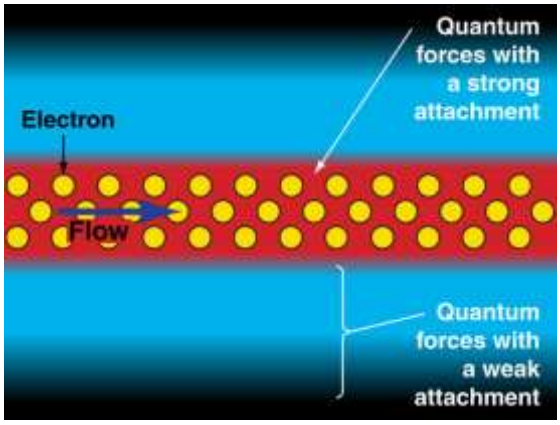
Electricity



Atom



Tightly packed electrons



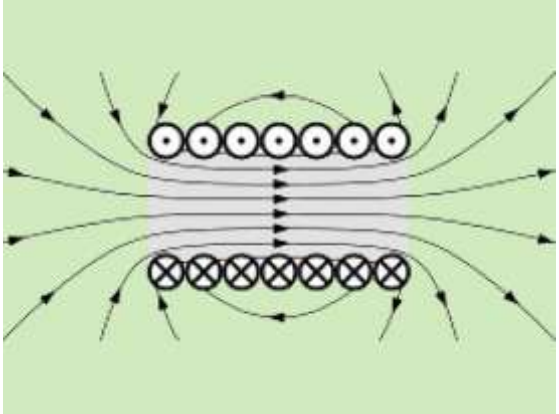
The flow of electrons and magnetic field

Attached quantum forces

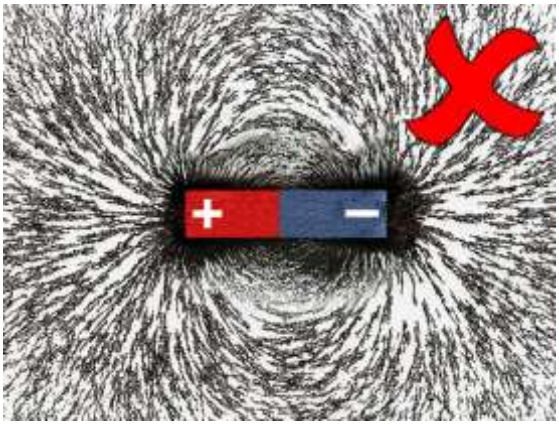
- Electrons are one of the smallest, if not the smallest, forms of matter, and each electron travels with its own attached quantum forces.
- So, why don't these quantum forces cause electrons to merge together to form a larger concentration, in the same way that celestial bodies gravitate towards each other?
- **Answer:** It all comes down to the relative size of the electron compared to its immediately-attached quantum force—it is the size of the electron that dramatically changes the mathematics and causes a net attraction forces to quickly change into a net repulsion force.
- It is my belief that if a photon of light were to be broken up by a very fine filter, then the fractured segments would become unstable and the light would dissipate into free quantum forces.
- It would appear that an electron, which is a larger concentration of compressed quantum forces than a photon, is large enough to be stable, but too small to cause a wide-reaching attraction force that would cause electrons to join together.
- This would suggest that the reason electrons exist within shells that are separated by specific distances from each other is because, each electron repels every election within a given shell, and each shell repels every other shell using the same repelling force.
- A change in the external pressure placed on a material, and its atoms, will cause a change in the orbital radius of all the shells of each atom, which means an atom is effectively 'spring loaded' with external pressure ultimately controlling its size.

Electric motors

Electric motor



Solenoid



Positive and negative charges

Components of an electric motor

Introduction

- In order to understand the physics of an electric motor, you need to understand:
  - the movement of attached quantum forces caused by the movement of physical matter (i.e. electrons)
  - the movement of free quantum forces caused by the movement of attached quantum forces, and
  - the movement of physical matter (i.e. the rotor, rotating shaft, or axle) caused by the movement of attached quantum forces.

Electric motors

- Most motors use some form of energy to generate the mechanical action of torque or rotation.
- Electric motors use electrical current to generate mechanical motion.
- Electric motors can be adapted to the use of either direct current (DC), or alternating current (AC).
- A solenoid is a type of electric motor that generates lateral (axial) movement rather than radial (rotational) movement.

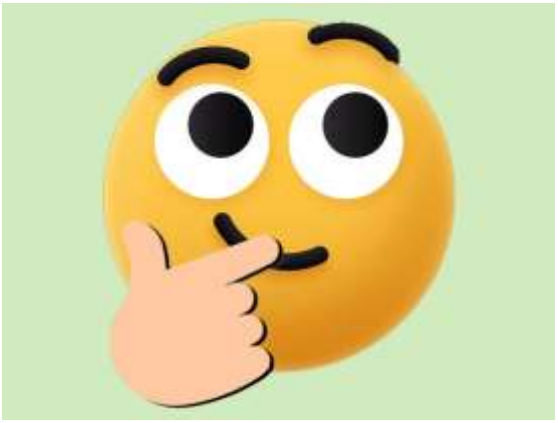
Charged particles

- A belief in the quantum force model of the universe means no longer having to adopt the *positive (+)* and *negative (-)* approach to the identification of particles.
- In the past, particles were arbitrarily labelled either positive or negative based on an electron being considered negatively charged.
- However, the operation of electric motors has **NOTHING** to do with positive and negatively charged surfaces.

Terminology

- Armature – the winding of wire that surround a ferromagnetic core (the electromagnet).
- Brushes – electrical contacts connected to the commutator.
- Commutator – a rotary electrical switch connected to the rotor, which periodically reverses the electrical flow.
- Rotor – is the rotating axle of the motor.
- Stator – this is the casing that surrounds the rotor, and usually holds the magnets.

The big ‘untruth’ in electromagnetic science



Thinking

Problem

Disagreeable

Happy for now!

The statement

- There is a ‘statement’ that has been repeated numerous times by the electromagnetic industry that I believe has a questionable connection with the truth.
- I am far from being an expert on this topic, but this statement appears to be linked back to the Lorentz force law, and possibly Faraday’s law of induction.
- The statement has been written in many different ways, but the statement looks something like this:

‘An electric current passing through the wire causes the magnetic field to exert a force.’

‘A moving charge in a magnetic field experiences a force perpendicular to its own velocity and to the magnetic field.’

*‘A charged particle that is moving with velocity **V** in a magnetic field **B** will feel a magnetic force **F**.’*

- Unlike the above quotes, I suspect that both Lorentz and Faraday chose their words more carefully.
- The problem has likely occurred because the correct wording has been shortened, and key words have been dropped over time, causing the now false outcome.

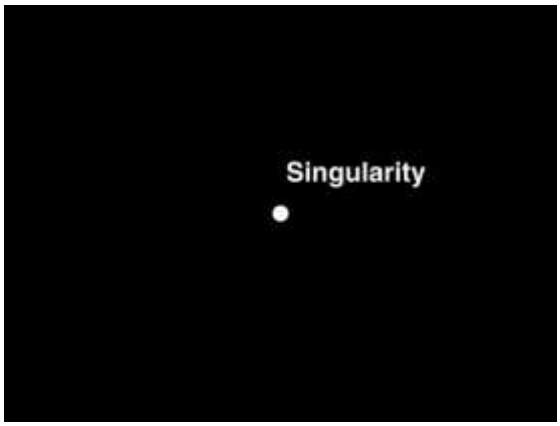
So, what is it that I believe is so wrong with these statements

- My problem is that the above statements suggest that a force will always exist if a charged particle moves through a fixed magnetic field.
- My first objection is to any and all reference to ‘charged’ particles!
- My second objection is to the fact that a force does not always exist in such cases—it depends on the velocity of the electrons (and I mean: speed & direction).

The truth

- If a force always existed, then a frictionless electric motor would continue to accelerate its rotational velocity, but it doesn’t.
- An electric motor will settle on a specific rotational velocity for a given magnetic flux and electrical current.
- In other words, there is a rotational velocity where no force is generated.
- I trust that both Lorentz and Faraday were aware of this fact.

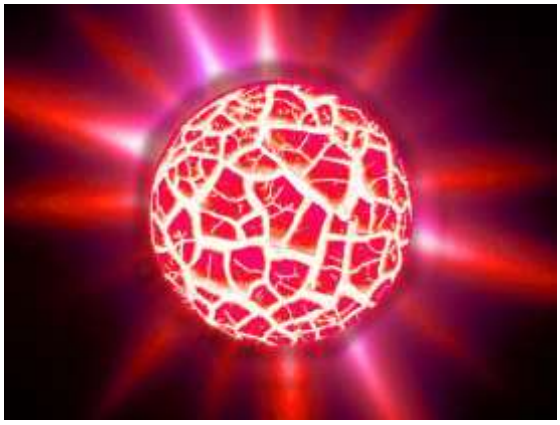
Why does a magnetic field always want to move to the 'right'



Singularity

Introduction

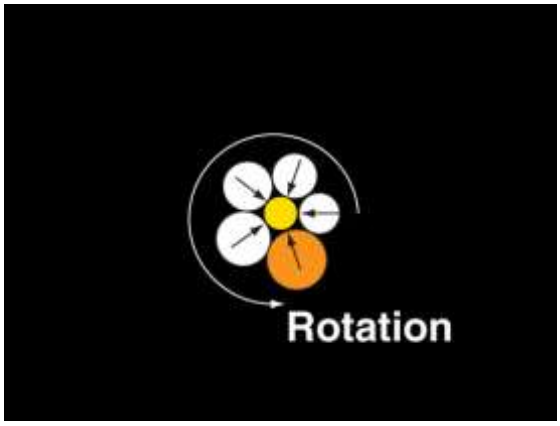
- The following discussion is pure speculation on my part—it is based solely on logic, with just a bit of physics.
- What I am attempting to explain is:
  - what caused quantum forces to start spinning
  - why all quantum forces spin in the same direction
  - why a quantum force always wants to move to the left of an approaching quantum force.



The Big Bang

The Big Bang

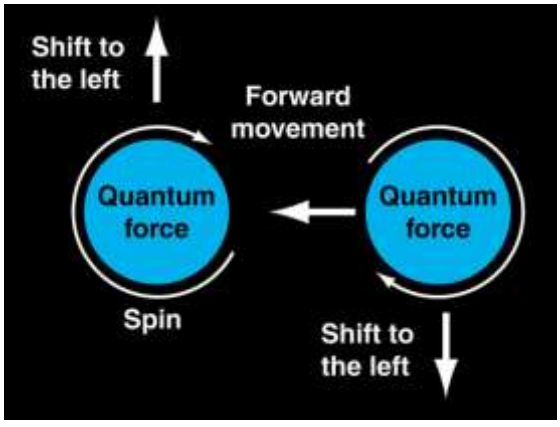
- This explanation is based on the following assumptions:
  - prior to the Big Band, the universe existed as a singularity
  - the expansion of a singularity results in a two-dimensional expansion due to the effective 'cloning actions' of each unit of expansion
  - the early stages of the expansion consisted of cloned units moving in two dimensions.



Rotation develops

The 'spin'

- In the early stages of the expansion, the effects of mass and inertia resulted in time delays, and ultimately, non-uniformity across the expanding universe.
- Chapter 14 describes a means for the staged release of quantum forces (Qforces) from the singularity to cause the growing universe to start spinning.
- However, the spinning of individual quantum forces is more likely to be linked to collision, which would ultimately cause all Qforces to spin in the same direction.



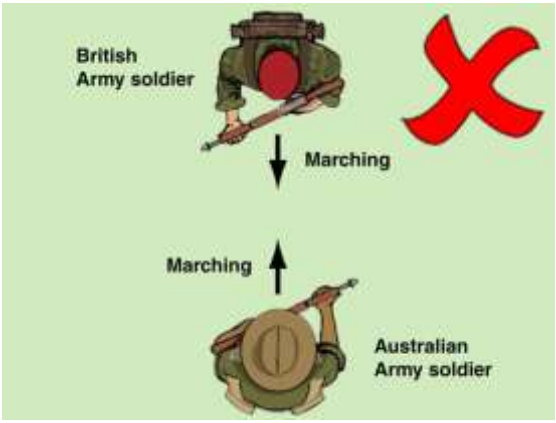
A shift to the left

Moving to the (~~right~~) left

- If all the quantum forces have the same direction of spin, then if one magnetic field approached another magnetic field, then to avoid a collision, the two quantum forces will move to the left of each other.
- Now, because all quantum forces like to exist in an evenly-spaced grid, if one quantum force moves to the left, then the whole grid will want to move to the left.

Note: Nothing in the universe could have forced a quantum force to change its axis.

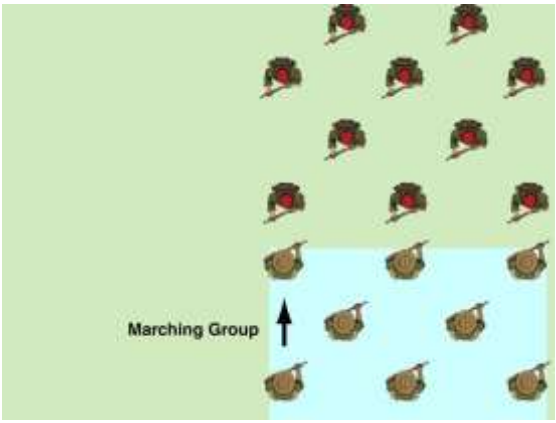
Marching group approaches a stationary group



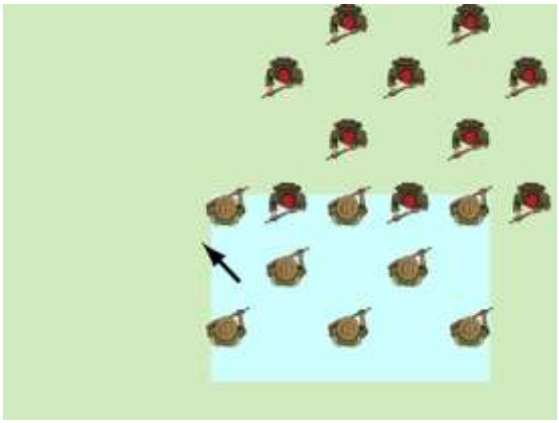
Step 'right' to avoid a conflict

Understanding the 'step-to-the-left' via a marching army analogy

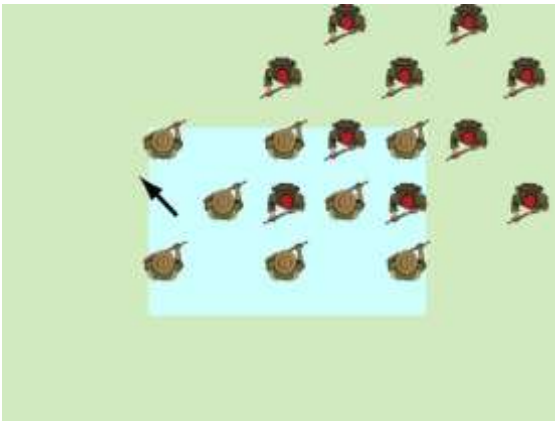
- When soldiers are marching towards each other, in order to avoid a collision, the two parties need to either step to the right of each other, or step to the left.
- However, if the approaching objects are spinning with a common axis of rotation, like quantum forces, then the direction of this step will be determined by their spin.
- The direction of spin of quantum forces was random, but now that the direction is chosen, it will remain.



Marching soldiers approach each other



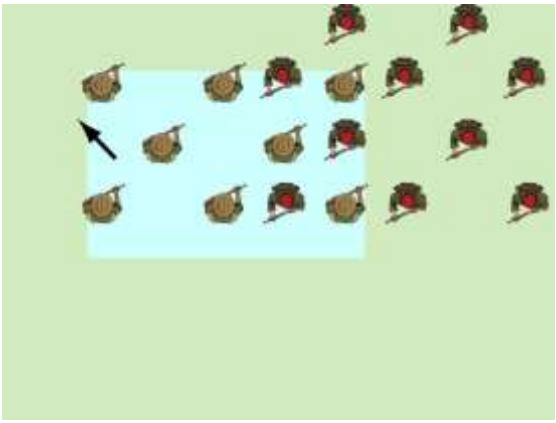
Step forward and to the left



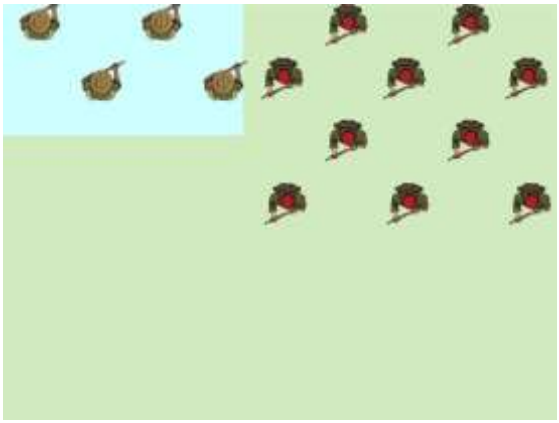
Step forward and to the left

Team work

- Because of the uniform spacing, where one team member goes, the rest of the platoon shall follow.
- If you had to mesh two table forks, then you would only need to focus on one tine on each fork—you know that if you mesh two of the tines correctly, the rest of the tines on each fork will also mesh correctly.
- The same thing applies to the quantum forces that make-up a magnetic field; if one quantum force goes left, then the rest of the quantum forces will follow.

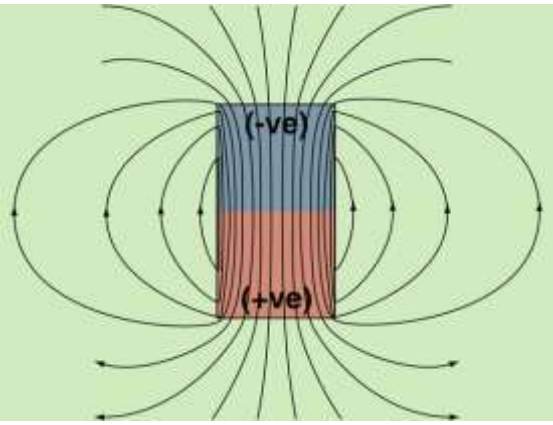


Step forward and to the left



The platoons are now separated

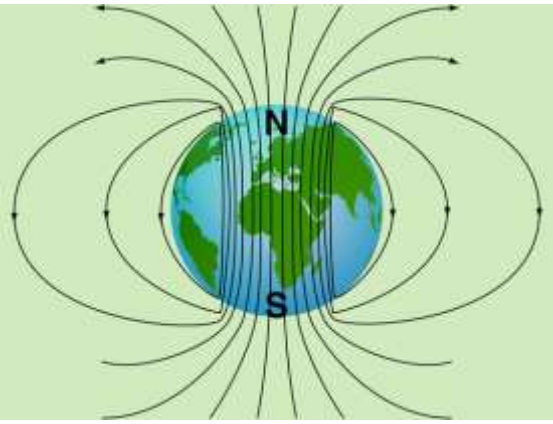
The reason why planets spin (actually, just one of the reasons)



Conventional flow

Introduction

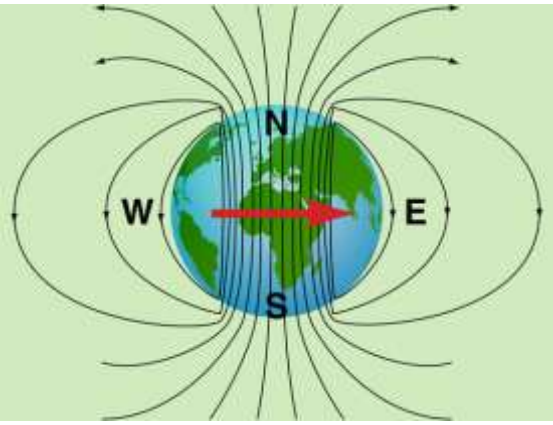
- So, an electric motor works because:
  - part of the motor holds a fixed magnetic field
  - a movable part of the motor carries an electrical current, which causes its attached quantum forces to move, which generates a moving magnetic field
  - when the movable magnetic field passes through the fixed magnetic field, the movable magnetic field is forced to step 'right'.



<u>Actual</u> movement of quantum forces

The Earth

- So, the Earth has:
  - a potentially movable (spinning) field of quantum forces attached to the Earth
  - a moving field of quantum forces attached to the Earth's moving core of molten iron and nickel.
- When the movable quantum forces attached to the Earth passes through the moving magnetic field, the movable quantum forces, which are attached to Earth, are forced to step 'left'.



The direction of the Earth's spin

The cause of Earth's spin

- Therefore, the Earth spins because it acts like a very large electric motor.
- The Earth has a flow of attached quantum forces that actually moves from the South pole to the North pole (i.e. the opposite of what is considered the conventional flow of a magnetic field).
- If the 'fixed' quantum forces that are attached to the various physical particles of the Earth 'step left', then this would mean the Earth would spin west to east!

Celestial bodies

Which celestial bodies spin

- The proposal that I have presented here suggests that only celestial bodies with an active magnetic field would spin as a result of this action.
- I am unaware of whether this is the case.
- However, it should also be noted that some smaller moons could develop a spin due to past asteroid collisions.

Lessons

Magnetism is generated by the flow of free or attached quantum forces

- Magnetism is generated by forces.
- The forces that generate magnetism are the same forces that generate ‘gravity’, the same forces that stabilise and bind atoms, and the same forces that continue to expand the universe.
- Magnetism is generated by the flow of free and attached quantum forces.

Electricity is generated by the flow of concentrated quantum forces

- Electricity is generated by forces.
- The forces that generate electricity are the same forces that generate ‘gravity’, the same forces that stabilise and bind atoms, and the same forces that continue to expand the universe.
- Electricity is generated by the flow of items of concentrated quantum forces (i.e. matter).

Returning spacecraft can be deflected by Earth’s magnetic field

- Earth’s magnetic field is formed from the same quantum forces that surround all physical matter, including returning spacecraft.
- Quantum forces have just one ‘action’ that being to repel all other quantum forces; consequently, Earth’s magnetic field will try to repel objects of matter.
- Earth’s atmosphere could not divert the travel path of a spacecraft because the craft is travelling a supercritical speed.

Large celestial bodies spin because the act like large electrical motors

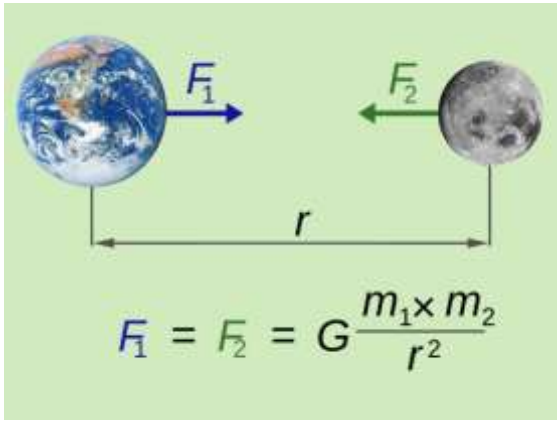
- The Earth contains a rotating magnetic field, which is formed from moving quantum forces.
- The Earth has attached quantum forces.
- The Earth’s rotating magnetic field must pass through the Earth’s fixed attached quantum forces, which is an action that will force the Earth to spin, just like a large electric motor.

11. The Force of Gravity

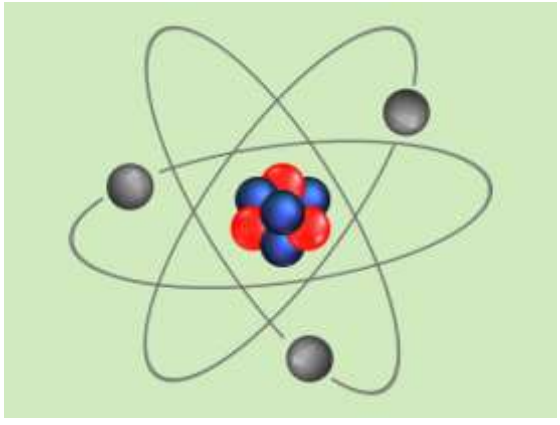
Introduction

Albert Einstein

The Big Bang



The gravitational equation



Atom

The work of Albert Einstein

- My understanding of fluid mechanics is telling me that almost everything that Einstein concluded about 'light' and 'gravity' was wrong.
- I know that I am not smarter than Einstein; not even close; but I do understand fluid mechanics.
- I just see something in the behaviour of 'space' that tells me that the physics is not as complex and counter-intuitive as Einstein made it appear.

The key to understanding 'gravity'

- The key to understanding gravity is:
  - To think about 'space' as if it were like an expanding gas—like a continuous substance, with no empty spaces—and with one action, that being to repel itself, and hence continue to expand.
  - To accept that the **net** repelling force generated by a three-dimensional field of quantum forces is somehow linked to the gravitational equation:

    $$F = (G.m_1.m_2)/r^2$$

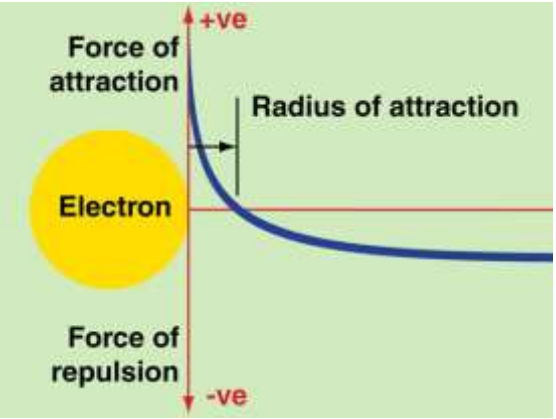
  - To accept that if a concentration of this substance occurs, which would alter the value of the term 'm_1' (above), then the net repelling force generated by the surrounding quantum forces would increase, which would push inwards on this concentration, making the concentration stable.
  - And to accept that if another concentration of this substance occurred nearby, then this gravitational equation (or similar) would generate a net force that would push these two concentrations towards each other.
- A force-based model of the universe shows us that gravity:
  - is a force
  - is the same force that are causing the universe to expand, and
  - is the same force that generates magnetism and the strong and weak atomic interactions.
- You can call the substance that fills 'space' whatever you like: aether, energy, or dark matter (which it is), but I have chosen to call it quantum forces (because it is small, and it is a force).

The gravitational equation

Sad

My personal failure

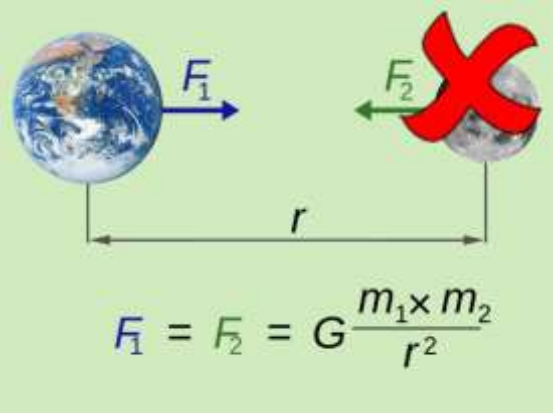
- The knowledge that I bring to the science of astrophysics is that of fluid mechanics.
- However, where my knowledge falls well short is in my limited understanding of complex mathematics.
- I was unable to develop a mathematical model of the forces generated by a three-dimensional field of quantum forces.
- I just know (believe) that the net force between two bodies is going to be similar to the current gravitational equation.



The generation of a repelling force

The missing part of the gravitational equation

- The following discussion about a possible correction to the current gravitational equation is, in my opinion, the most important outcome of this paper.
- **The issue is:**
  - The existing gravitational equation asymptotes to zero, when it should asymptote to the background repelling force that exists in deep space.



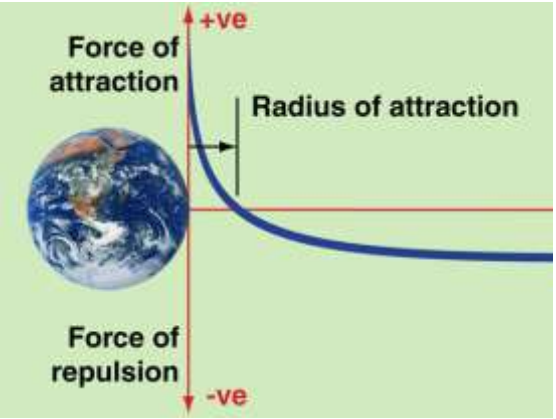
The problem

The problem with the current gravitational equation

- The current gravitational equation is:

$$F = (G.m_1.m_2)/r^2$$

- This equation suggests that the farthest object in space will still be 'attracted' towards any other object in space.
- I believe that such an outcome is wrong.
- If this were true, then there would be no net force causing the universe to expand.



The correction

Correction to the gravitational equation

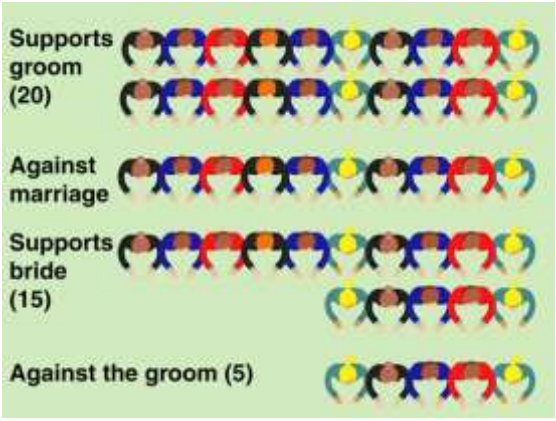
- In the force-based model of the universe, 'space' is filled with a substance that continues to expand due to an internal repelling force (the quantum force).
- Therefore, the gravitational equation needs to asymptote to this background repelling force, not to zero.
- **This simple result is the key to understanding the link between the force of gravity, and the forces that hold an atom together.**

Understanding how a repelling force can generate an attracting action

Explanation

Introduction

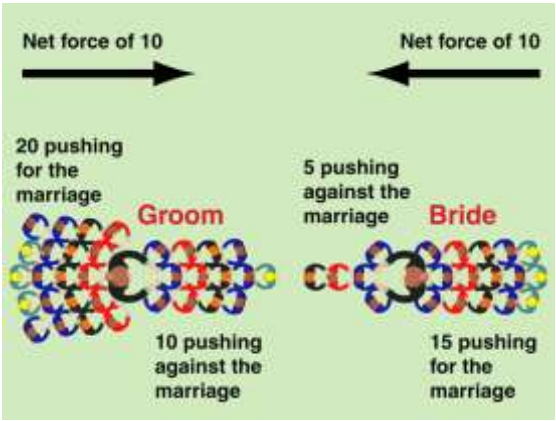
- At the beginning of this paper, I made the claim that all forces are repelling forces.
- There is no such thing as an 'attracting' force, just as there is no such thing as a true suction force.
- So, on this page I will try to demonstrate how repelling forces can generate the 'appearance' of an attracting force.
- And thus, I will try to explain how the actions of gravity are generated solely by repelling forces.



The full wedding party

Consider a very large group of wedding guests

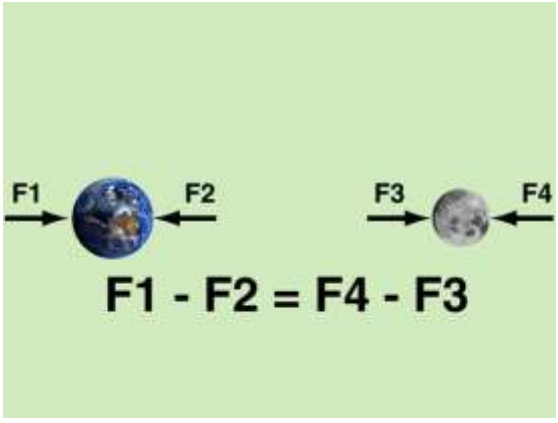
- Consider a wedding where there are:
  - 20 guests pushing the groom to marry the bride
  - 10 guests pushing the groom away from the bride
  - 15 guests pushing the bride to marry the groom, and
  - 5 guests pushing the bride away from the marriage.



Those for and against the marriage

The net force of attracting

- Of the 30 quests on the groom's side of the wedding, there is a net force of 10 people pushing the wedding to go ahead.
- Of the 20 quests on the bride's side of the wedding, there is also a net force of 10 people pushing the wedding to go ahead.
- Even though each guest can only exert the action of 'pushing their point of view', it turns out that there is a net force of 10 guests pushing the groom towards the bride, and the bride towards the groom.

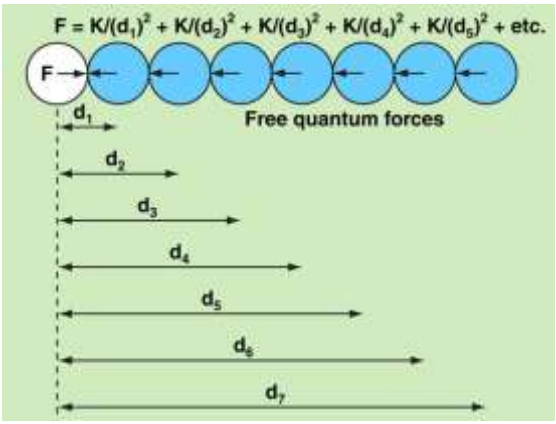


Forces acting on the Earth and Moon

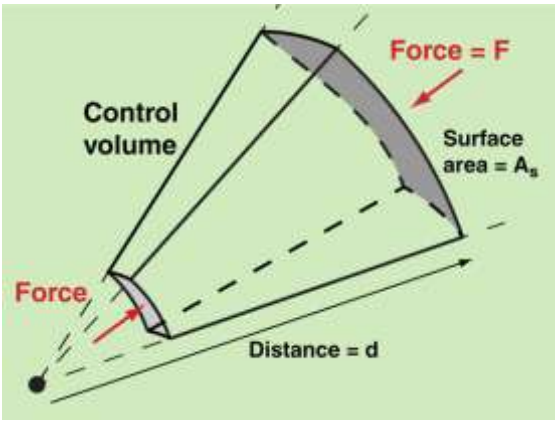
The Moon is being pushed towards the Earth

- The actions of gravity behave in a similar way to produce an 'attracting' action solely through the actions of repelling forces.
- Consequently, the Earth and Moon are being pushed towards each other with more force than they are being pushed apart.
- 'Space' pushes inwards on the Earth forcing it into the shape of a sphere, and 'space' pushes the Earth and Moon towards each other.

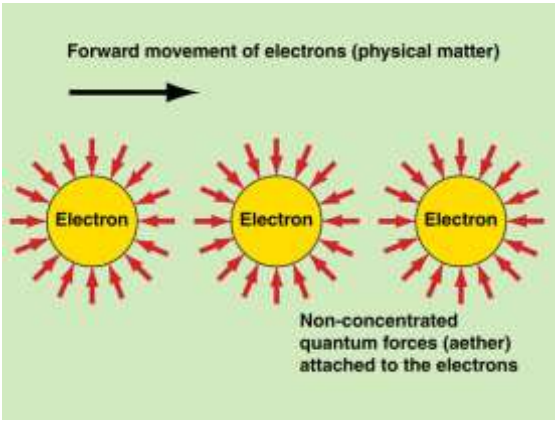
The repelling force of attached quantum forces



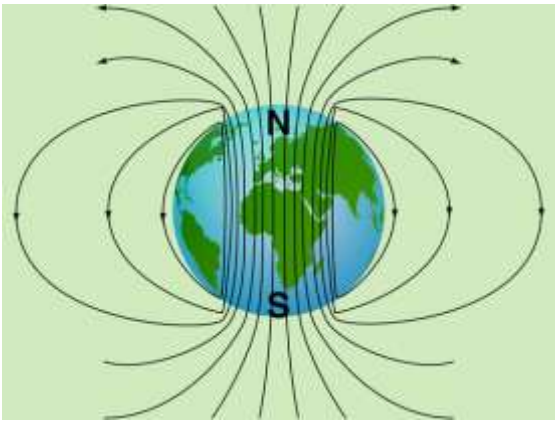
Interaction between quantum forces



Forces acting on a segment of a sphere



Quantum forces attached to electrons



Quasi-free quantum forces

The effects of distance

- As previously mentioned, quantum forces have just one task, or action, that being to repel all other quantum forces.
- The magnitude of the force exerted by one quantum force on an adjacent quantum force depends on:
  - the sum of the mass of quantum forces, in a given direction, divided by the square of the distance of each quantum force from the principal quantum force
  - in other words, the force increases with the concentration of quantum forces.

Forces acting on a central object

- In a force-based system, if we:
  - consider the forces acting on a control volume where there is no force applied to the sides, then we find that the force per unit area acting at each end must be inversely proportional to the square of the distance from the centre in order for the total force (F) to be constant
  - this is because the surface area of a sphere increases with the square of its radius (surface area = $4\pi r^2$).

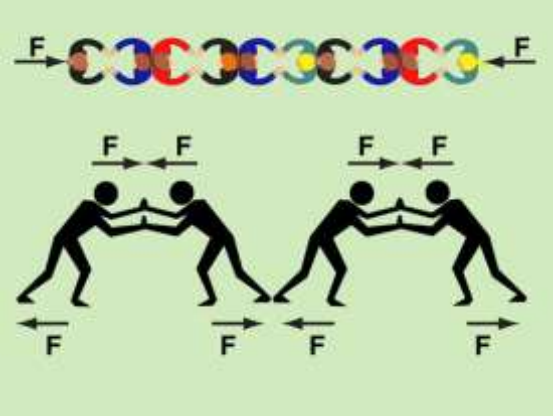
Quantum forces attached to electrons

- The region of influence of a quantum force is significantly smaller than an electron.
- Quantum forces will push inwardly upon electrons because electrons are formed from a concentration of quantum forces (just like a planet).
- Thus, electrons will always be surrounded by a ring of attached quantum forces, which will control the spacing of electron shells for any given background pressure or temperature (this is not the case for a photon of light).

Quantum forces attached to Earth

- Quantum forces are attached to every element of a planet, including every electron and nucleus—they are what makes every free-forming object want to take the shape of a sphere.
- Within any planet, there will be quantum forces that can move freely through the planet while staying within the planet, and those that can spend part of their time within the planet, and part of their time outside the planet, such as those that form Earth's magnetic field.

Quantum forces act like point forces, not like pressure



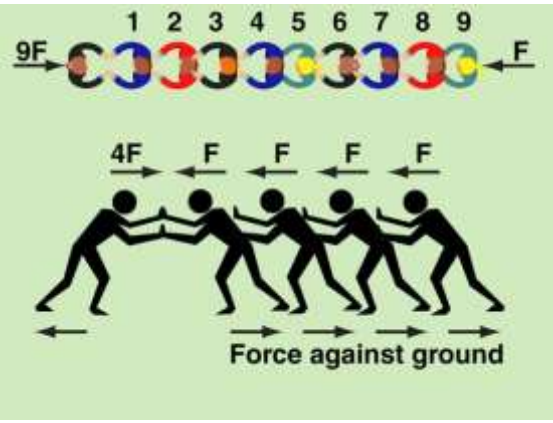
Simulating pressure force

The action of pressure/heat

- It would seem logical to think of quantum forces as acting like a fluid in a pressure container, but quantum forces don't act like pressure, they act like a collection of individual point forces.

The following discussion is not perfect, but I hope that it will give you a bit of an idea.

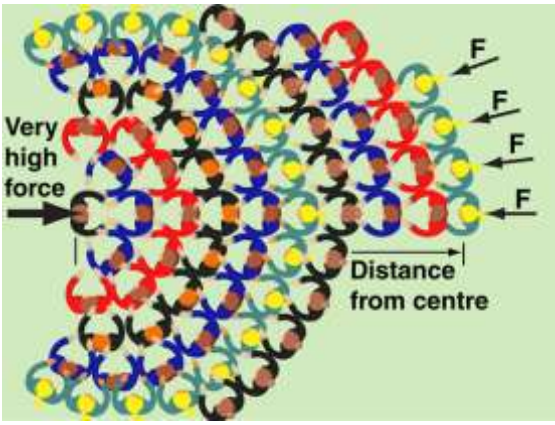
- The action of pressure is like a crowd of people standing back-to-back, pushing each other such that the net force is balanced between any two people.



Simulating quantum force

The action of quantum forces

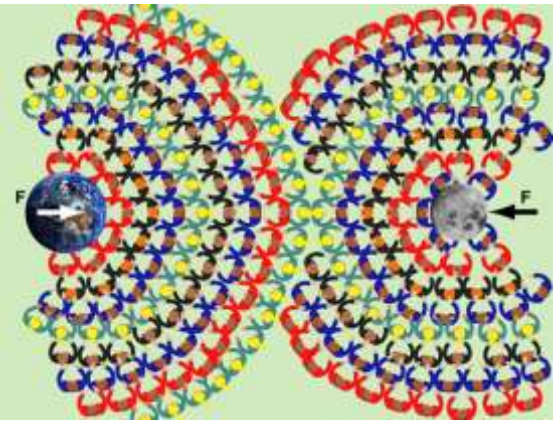
- However, quantum forces work in a different way—if a concentration occurs (i.e. matter), then:
  - a concentration of attached quantum forces surrounds the matter
  - they push against each other, as well as pushing against the matter
  - as much as they push outwards, they are being pushed inwards with a greater force.



Simulating gravitational forces

Forces on a central object

- The surface area of a sphere varies with the square of its radius (area = $4\pi r^2$).
- When quantum forces surround a planet, the surface area of the net force pushing towards the plant also increases with the square of the distance from the planet.
- This means that the force acting on each quantum force decreases with the square of the distance, which causes the region of influence of each quantum force to increase with its distance from the planet (not shown in these diagrams).

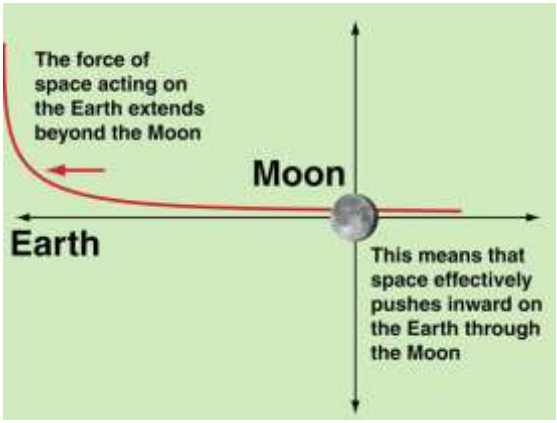


Simulating planetary 'attraction'

Action of forces on two objects

- The forces that surround any star, planet or moon, extend across space for vast distances, but not indefinitely.
- When two celestial bodies are close to each other, the sphere of influence of the quantum forces that surround each moon or planet will overlap each other, and the attracting forces will be superimposed.
- Ultimately this action causes a net force to push these two objects towards each other, which is the force we call 'gravity'.

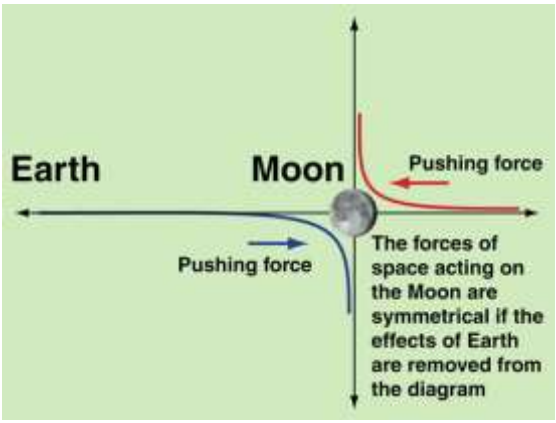
The effects of concentrating quantum forces



The force of Earth's gravity

The force of 'space' acting on the Earth

- So, why doesn't a concentration of quantum forces simply explode due to its combined internal, repelling forces? and . .
- Why doesn't the repelling force of all the quantum forces that make-up the Earth, simply push the Moon away?
- In order to understand these issues, we need to look at the combined forces exerted between the Earth and the Moon.
- This diagram graphs the force acting by space, and towards the Earth.

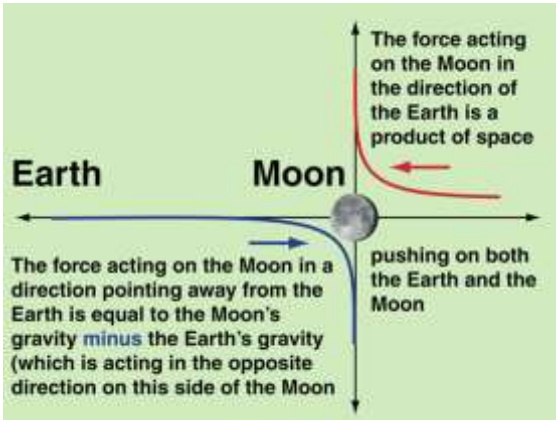


The force of the Moon's gravity

The force of Space acting on the Moon

- If we consider the Moon in isolation, then there is a similar, but much smaller, parabolic force curve positioned around the Moon.

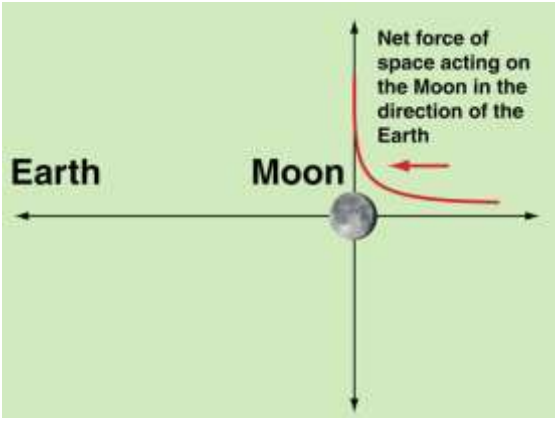
This diagram shows all forces that are directed towards the left (i.e. towards the Earth) as +ve (red), and towards the right as -ve (blue).



The combined forces acting on the Moon

Combining the forces acting on the Moon

- Thus, the net force generated by the quantum forces, will result in:
  - the Earth pushing on space & Moon
  - the Moon pushing on space & Earth
  - space pushing on the Earth & Moon.
- However, it is important to note that the forces acting between the Earth and space, extend through, and beyond, the Moon.
- Ultimately this results in a net force **pushing** the Moon towards the Earth.

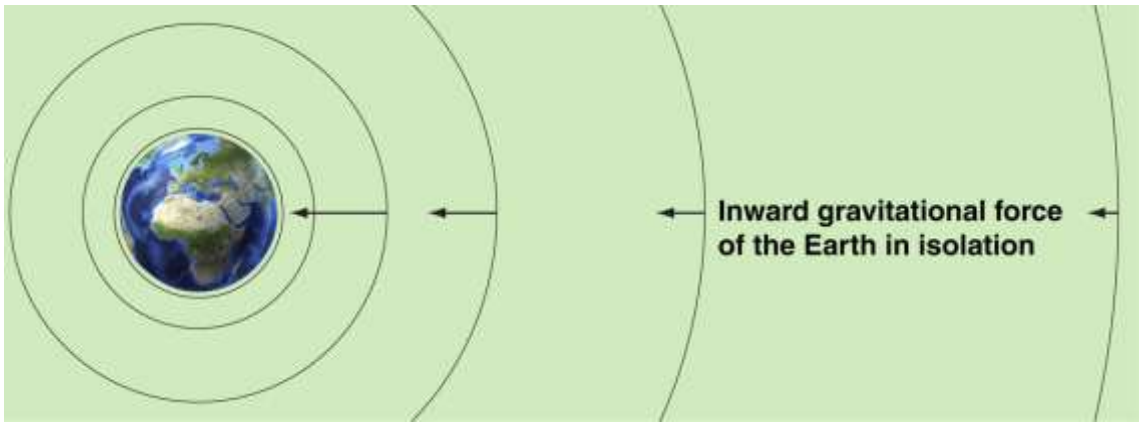


The net force acting on the Moon

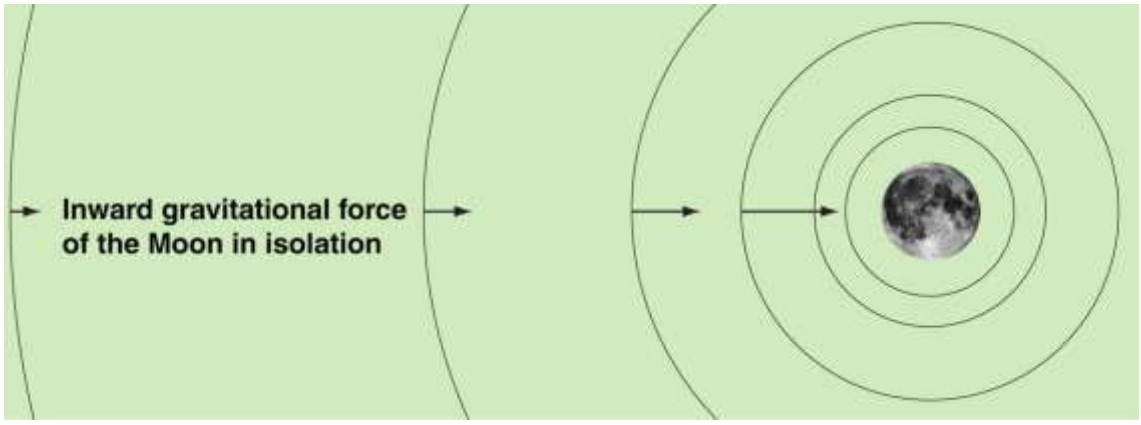
The net force acting on the Moon

- Summing all these forces, we will find that there is a net force acting on the Moon in the direction of the Earth.
- This means that in a field of evenly-spaced (free) quantum forces, these quantum forces will:
  - push inwards on a concentration of quantum forces (e.g. a planet), and
  - push any two concentrations of quantum forces (e.g. a planet and moon) towards each other.

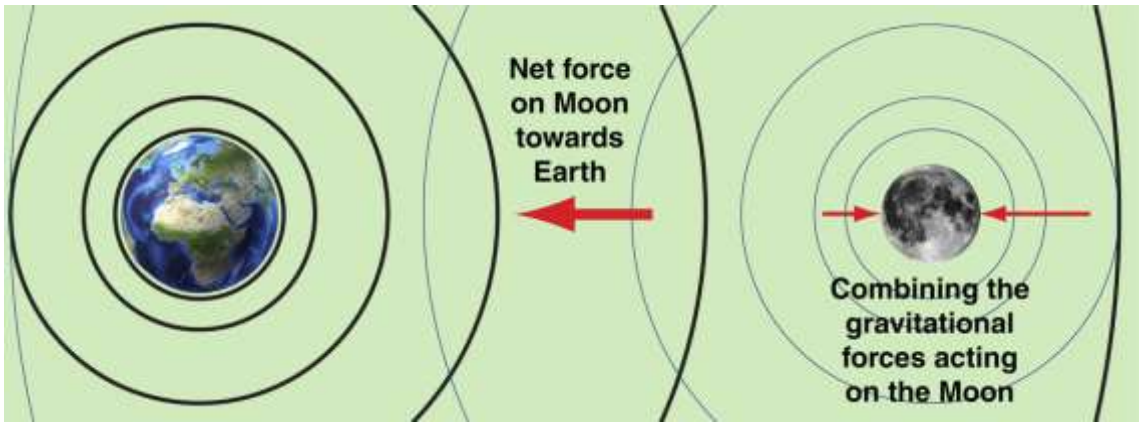
Gravitational forces acting on the Earth and Moon



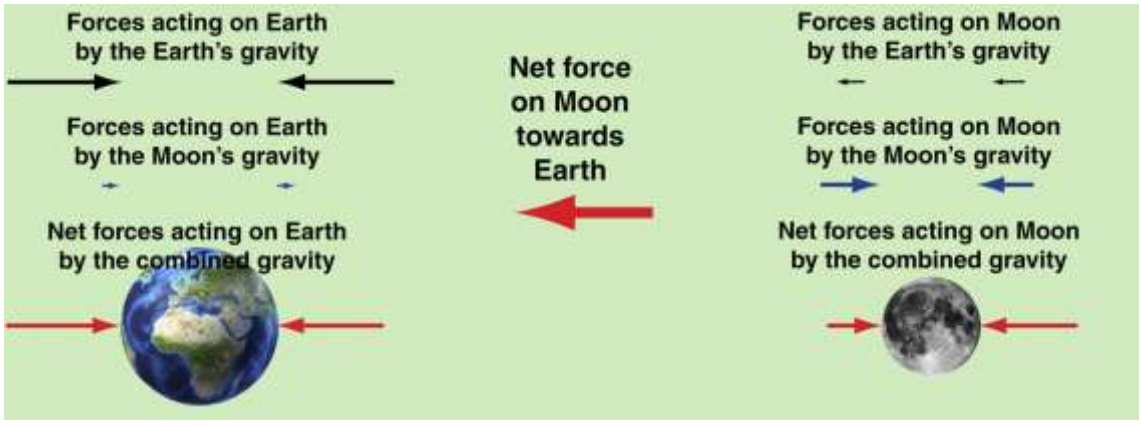
Inward compressing force on the Earth in isolation



Inward compressing force on the Moon in isolation

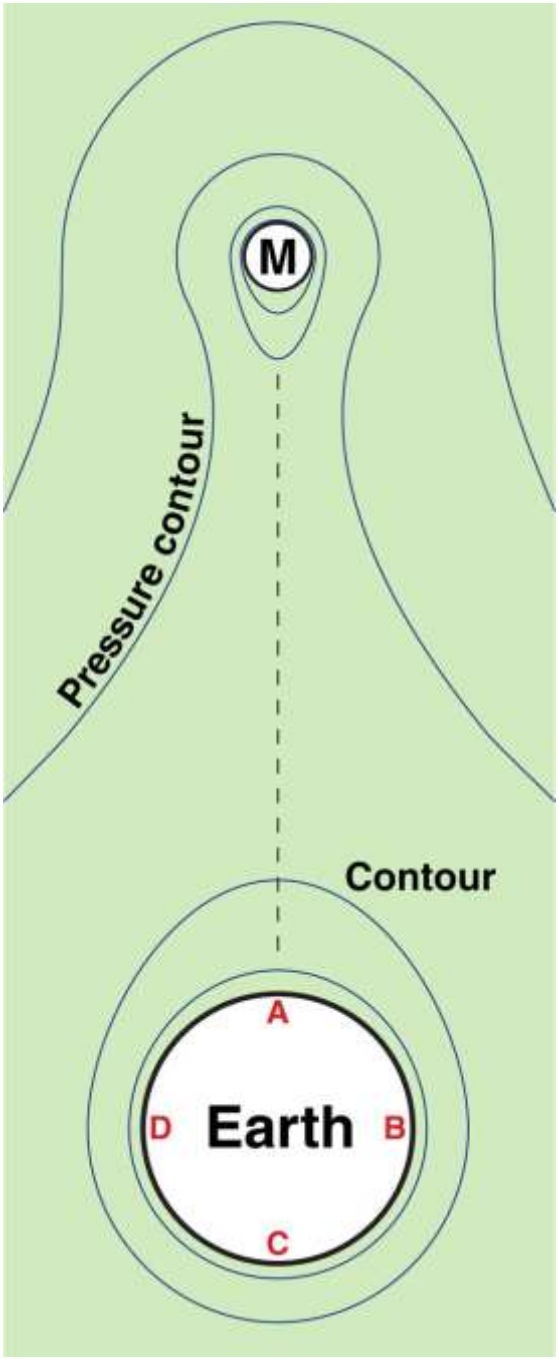


Combined forces acting on the Earth and Moon

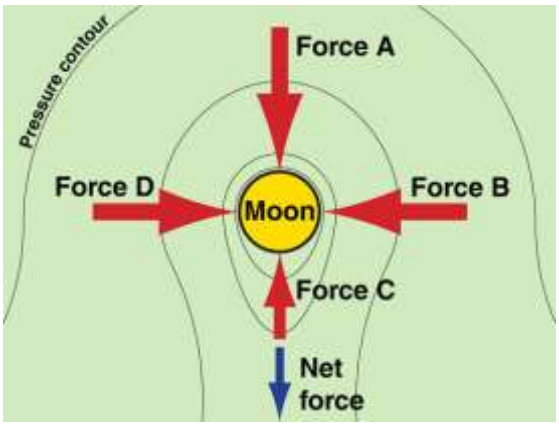


Combined gravitational forces acting on the Earth and Moon

Gravitational forces surrounding the Earth and Moon



Gravitational field (time contours)



Forces acting on the Moon

Forces acting on the Earth and Moon

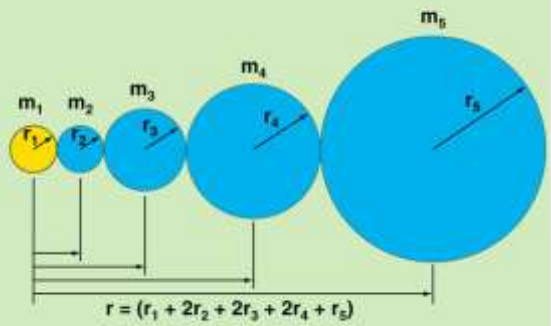
- Because the Earth and Moon exist in close proximity to each other, the forces acting on the Earth and Moon, by space, are asymmetric.
- The asymmetric nature of the forces acting on the Moon result from the fact that the Earth's gravitational field extends through the Moon, and beyond.
- The superposition of the Moon's gravitation forces, onto the Earth's gravitation forces, generates a net force acting on the Moon in the direction of the Earth.
- **Analogy 1:** Readers may wish to think of the pressure forces exerted by space on planets as being similar to the way that fluids in a glass will exert a pressure on bubbles of gas rising through the fluid.
- In a glass of sparkling water, the surface of the water represents the point of 'zero' water pressure, which can be compared to the edge of space (i.e. the edge of our universe).
- **Analogy 2:** Alternatively, readers may wish to consider the pressure gradients (blue lines) displayed in this diagram as representing the depressions left by a bowling ball (the Earth) and a shot-put (the Moon) when placed on a foam mattress.
- If we consider the effects of a bowling ball and a shot-put placed on a mattress, we should not be surprised to find that the bowling ball and a shot-put will slowly move towards each other.

It is this second analogy that links my work to Einstein's curved spacetime theory, and to all those scientific demonstrations of a heavy sphere placed on a stretched elastic fabric.

Forces acting on the Moon

- The gravitational force generated by 'space' are shown here as point forces.
- Forces B and D are equal in magnitude.
- Force C is less than Force A because this side of the Moon is closer to the Earth.
- Force A is greater than forces B and D because the Earth's gravity increases the pressure gradient at location A, but not at locations B and D.
- The net force acting on the Moon is Force A minus Force C.

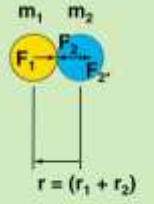
The mathematics (which I cannot fully resolve)



Electron and attached quantum forces

$$F_1 = F_2 - F_{2'} + F_3 - F_{3'} + F_4 - F_{4'} + F_5 - F_{5'} + \text{etc}$$

$$F_2 = \frac{G.m_1.m_2}{(r_1 + r_2)^2}$$



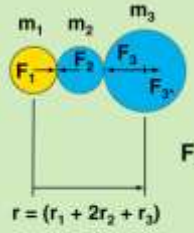
$$F_{2'} = \sum \frac{(G.m_2.m_n)}{(r_2 + 2r_3 + 2r_4 + 2r_5 \ldots)^2}$$

$F_{2'}$ = sum of forces of attraction to outer quantum forces

Forces acting on mass 'm_2'

$$F_1 = F_2 - F_{2'} + F_3 - F_{3'} + F_4 - F_{4'} + F_5 - F_{5'} + \text{etc}$$

$$F_3 = \frac{G.m_1.m_3}{(r_1 + 2r_2 + r_3)^2} + \frac{G.m_2.m_3}{(r_2 + r_3)^2}$$

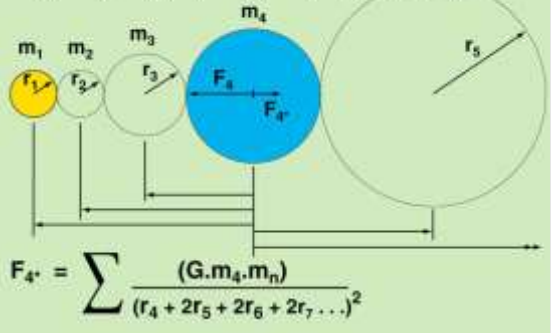


We could assume $m_2 = m_3$

$$F_{3'} = \sum \frac{(G.m_3.m_n)}{(r_3 + 2r_4 + 2r_5 + 2r_6 \ldots)^2}$$

Forces acting on mass 'm_3'

$$F_4 = \frac{G.m_1.m_4}{(r_1 + 2r_2 + 2r_3 + r_4)^2} + \frac{G.m_2.m_4}{(r_2 + 2r_3 + r_4)^2} + \frac{G.m_3.m_4}{(r_3 + r_4)^2}$$



$$F_{4'} = \sum \frac{(G.m_4.m_n)}{(r_4 + 2r_5 + 2r_6 + 2r_7 \ldots)^2}$$

Forces acting on mass 'm_4'

Introduction

- On this page I will describe the type of mathematics that demonstrates how the attached quantum forces ultimately generate a net force of attraction.
- This is NOT the correct mathematics, because (for one reason) in this example I have assumed that the effective size of the quantum force increases in proportion to distance, which is not correct.
- It could be that the base equation is very different, but the final outcome should resemble the gravitational equation.

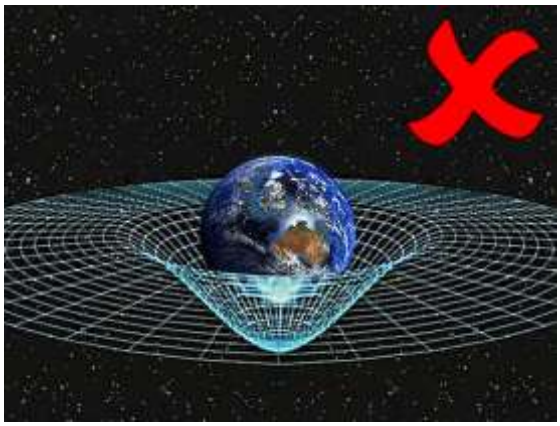
Forces acting on primary mass (m_1) and first secondary mass (m_2)

- There is a repelling force that exists between the primary mass (m_1) and the first attached quantum force (m_2).
- The primary mass can be anything from an 'electron' to a 'planet', or a black hole.
- Key to this analysis is the relative size of the primary mass (r_1) compared to the attached quantum forces (r_2, r_3, r_4, etc.).
- For an electron; $r_1 > r_2$.
- For a nucleus; $r_1 >>> r_2$.
- The repelling force (F_2) that exists between the primary mass (m_1) and the first attached quantum force (m_2) is governed only by masses m_1 and m_2.
- The repelling force ($F_{2'}$) that exists between the first attached quantum force (m_2). and the outer attached quantum forces involves mass m_2 and all the masses outside m_2.
- This same analysis is repeated for all the attached quantum forces until the outer most attached quantum force has an inward acting force equal to the local background repelling force of deep space.

The effect of particle size

- For a mass the size of our Sun, the attached quantum forces will extend beyond Pluto before the attached quantum force 'pressure' equals the background aether, after which, the net force converts to a constant repelling force.
- For a primary mass the size of an electron, the distance from the electron to the point where the net force converts from attraction to repelling, is microscopic, which means electrons repel each other, rather than attract each other.

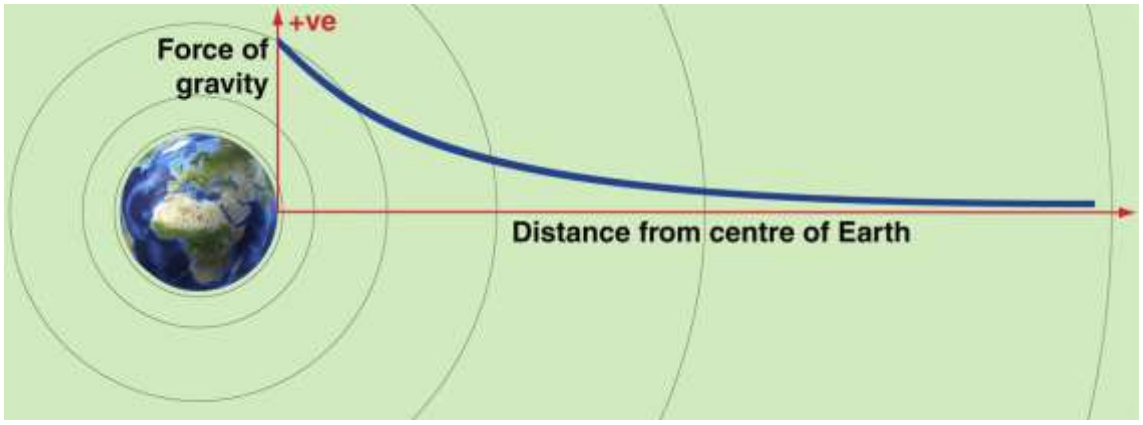
Creating the force of ‘attraction’ from the force of repulsion



‘Spacetime’ does not exist

The force of gravity adjacent the Earth

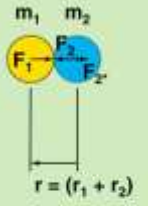
- Sorry Einstein, but gravity is <u>not</u> an action resulting from curved spacetime, and ‘time’ doesn’t even exist in reality; it is just a consequence of the speed of causality.
- Gravity, like everything in the universe, is a product of quantum forces, and the result of how these forces manage to turn a fundamental repelling force into a net force of attraction when applied in three dimensions around a central concentration of quantum forces.



Variation in the force of gravity with distance from Earth

$$F_1 = F_2 - F_{2'} + F_3 - F_{3'} + F_4 - F_{4'} + F_5 - F_{5'} + \text{etc}$$

$$F_2 = \frac{G.m_1.m_2}{(r_1 + r_2)^2}$$



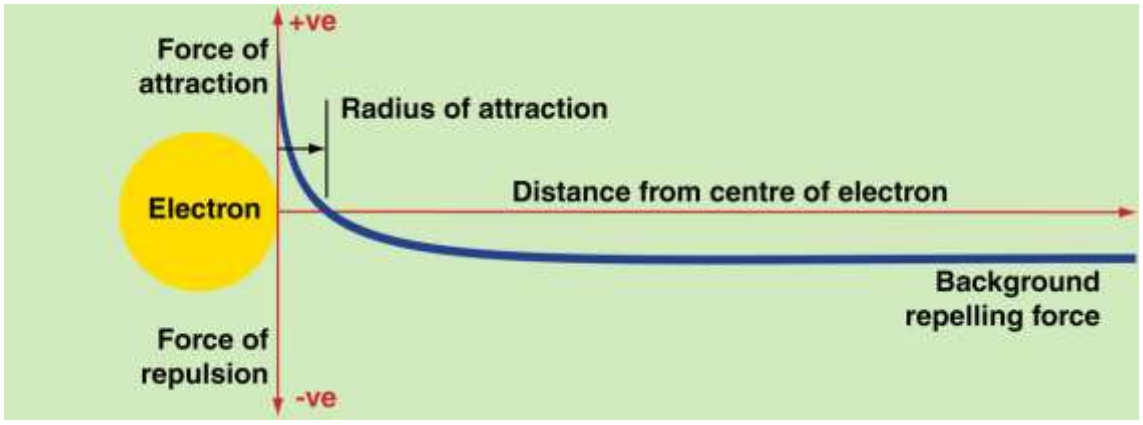
$$F_{2'} = \sum \frac{(G.m_2.m_n)}{(r_2 + 2r_3 + 2r_4 + 2r_5 \ldots)^2}$$

$F_{2'}$ = sum of forces of attraction to outer quantum forces

The relative size of mass and Q-force

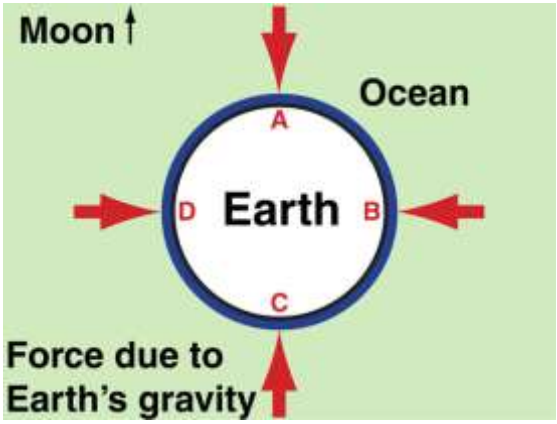
The force of gravity adjacent an electron

- The net force of attraction reduces with the square of the distance of separation.
- As the distance of separation increases, the net force reduces until it can no longer overcome the background force of repulsion shared by all free quantum forces, after which this repulsion force will dominate.
- The distance to this attraction–repulsion inflection varies with the relative size of the primary mass relative to the size of the adjacent quantum force.



Variation in the force of gravity with distance from an electron

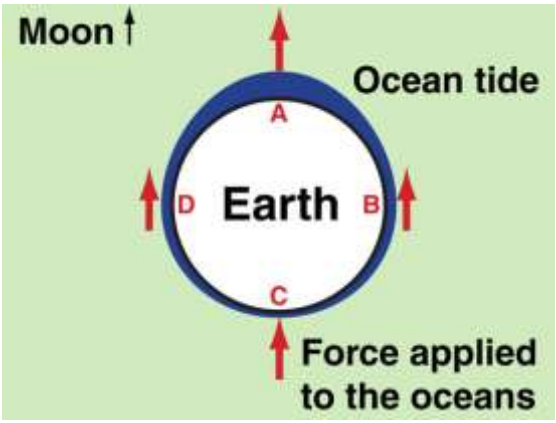
The cause of ocean tides



Earth's gravity acting on oceans

Earth's gravity and Earth's spin

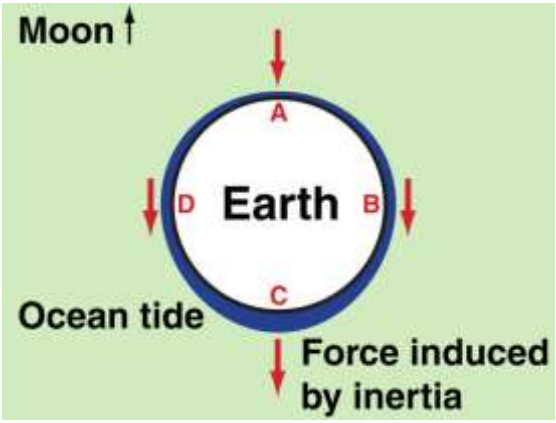
- The force (actually pressure) placed on the Earth's oceans by the Earth's gravity is near uniform around the planet.
- The spinning of the Earth around its own axis causes a bulging of the oceans near the equator, but this effect is constant and therefore does not interfere with the occurrence of ocean tides.
- Given that the Earth also bulges at the equator relative to the poles, this bulge in the Earth's oceans is less noticeable.



Moon's gravity acting on oceans

The effect of the Moon's gravity

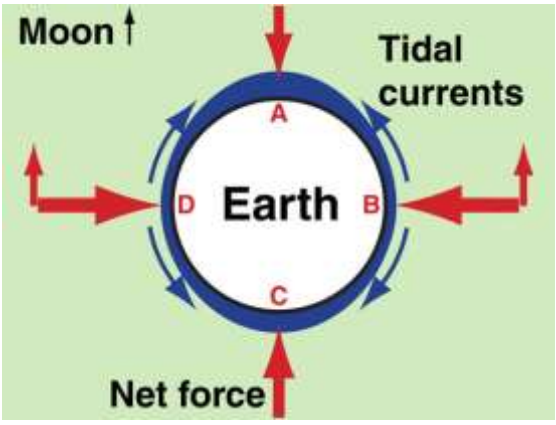
- The presence of the Moon generates an increased Space-induced force across all aspects of the Earth (i.e. this effect passes through the Earth).
- This gravitational force is acting towards the Moon.
- In isolation, this force would naturally cause the Earth's oceans to move towards the Moon.



Rotational inertia acting on oceans

The effect of the Earth-Moon rotation

- However, the Moon does not rotate (orbit) around the centre of the Earth; instead, the Earth and Moon rotate around their combined centre of gravity.
- The resulting rotation of the Earth around this centre of gravity causes an inertia-generated centripetal force, which acts on all parts of the Earth, including its oceans.
- In isolation, this force would cause the Earth's oceans to move away from the Moon.



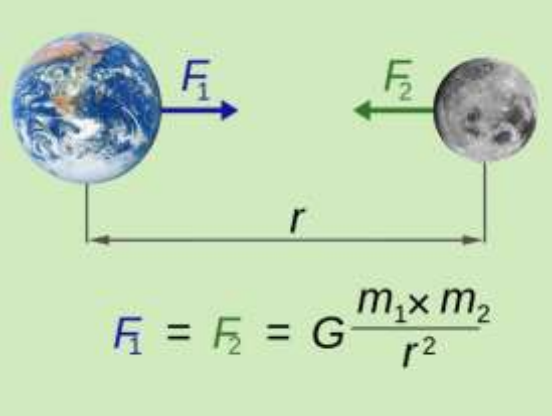
Net forces and tidal conditions

Ocean tides

- Combining the effects of the Moon's gravity and the ocean's inertia causes a higher high-tide on the side of the Earth facing the Moon, and a lower high-tide on the opposite side of the Earth.
- A high tide is not caused by the Moon 'pulling on' the water, but by gravity pushing down harder at locations B and D.

The forces applied to Earth's oceans are only shown (left) at locations A, B, C & D, but in reality, these forces act over the complete surface of the oceans.

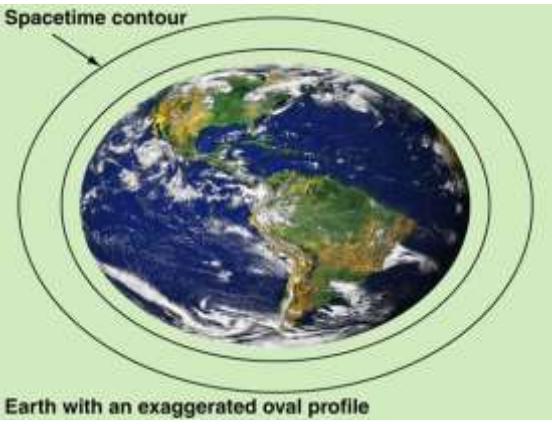
Variations in gravity around the surface of Earth



Equation for gravitational force

Warning:

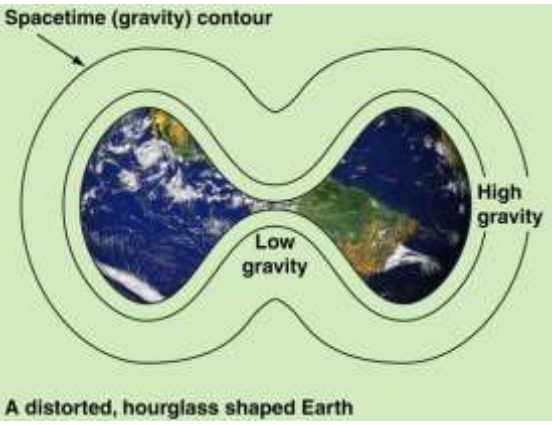
- The force of Earth's gravity is said to reduce with the square of the distance from the centre of the Earth.
- **However**, this relationship does not apply within the mass of the Earth, or around the surface of the Earth.
- The forces equation (left) suggests that the value of (F,r^2) is a constant around the surface of the Earth, but it is only a constant along a given axis.



Distorted, non-spherical shape

Non-spherical planets

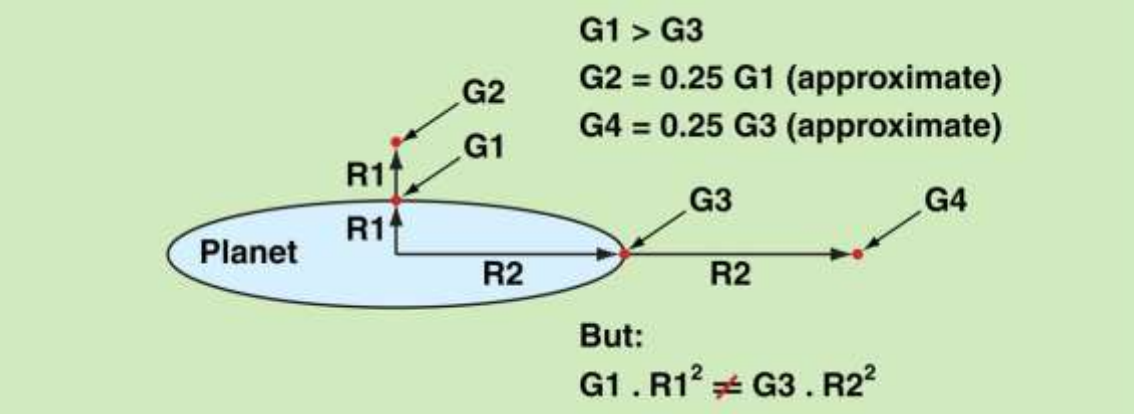
- If a planet had a non-spherical shape (like the Earth does), then the gravitational forces generated around the planet would also be non-spherical.
- The fact that the Earth's radius is 22 km shorter at the poles compared to the equator does not mean that variations in gravity from the equator to the poles will be proportional to changes in the radius of the Earth at these locations.



Hourglass-shaped planet

Consider an extreme case

- If you consider the extreme example of an hourglass-shaped planet, then the gravitational effect at the narrow neck would actually approach zero, not an infinite value as would be suggested by the gravitational equation.
- In the diagram below:
  - 'G' = gravitational force
  - 'R' = distance from centre of planet
  - G1 is greater than G3 because it is closer to the centre of mass, but not by a factor of ($R2^2/R1^2$).



Variations in gravity around an oval-shaped planet

Lessons

Gravity is a pushing force

- All forces in the universe are ‘pushing’ forces.
- All pressures in the universe are positive pressures—there is no such thing as a true vacuum, or a negative pressure.
- Gravity is a force.
- Gravity is a pushing force generated by the same forces that cause the ongoing expansion of the universe.

The forces that generate gravity also generate magnetism, the expansion of the universe, and the forces that bind atoms

- The forces that generate gravity, which have been termed ‘quantum forces’ in this paper, also generate magnetism, the expansion of the universe, and the binding forces that stabilise and bind atoms.
- The four know interactions of the universe are all generated by the same force.

Ocean tides are not caused by the Moon ‘pulling’ of the Earth’s oceans

- Ocean tides are not generated by a force that ‘pulls’ on the water particles.
- Ocean tides are not generated by a distortion of spacetime.
- Ocean tides are generated by forces pushing water particles towards the centre of the Earth.

The gravitational equation needs to be corrected

- Our current gravitational equation suggests that the force of gravity reduces to zero as the distance of separation expands towards infinity.
- A force-based model of the universe tells us that the gravitational equation should asymptote to a negative value (i.e. a repelling force) as the distance of separation expands towards infinity—this would be the current background force of deep space.

12. Atomic Interaction

Introduction

The author and a borrowed car in 1986

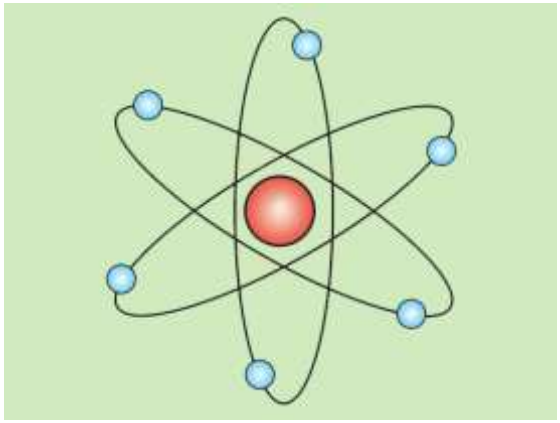
Introduction

- I entered the world of astrophysics in the 1990s because I wanted to find a more logical explanation of what drives ocean tides.
- Consequently, the topic of gravity is an issue that has captivated my thoughts for over 30 years.
- However, it is the topic of this chapter, 'atomic interaction' that I currently find the most interesting.

Quantum mechanics

My thoughts of quantum mechanics

- If I were smarter, then I would keep my opinions of 'quantum mechanics' to myself.
- However, I find myself not believing anything that quantum mechanics tells me about atomic interactions.
- In my worthless opinion, quantum mechanics is an example of really good mathematics that has been built on questionable foundations.



Atom

Understanding the mechanics of atoms

- You cannot compare the mechanics of an atom with the mechanics of celestial bodies.
- With celestial bodies, the radius of the Moon's orbit, and its mass, are critical parameters—change one of these parameters, and bye-bye Moon!
- In an atom, the forces are completely different, and almost any angular velocity and radius of orbit can be stable within an electron—it is a very stable system.

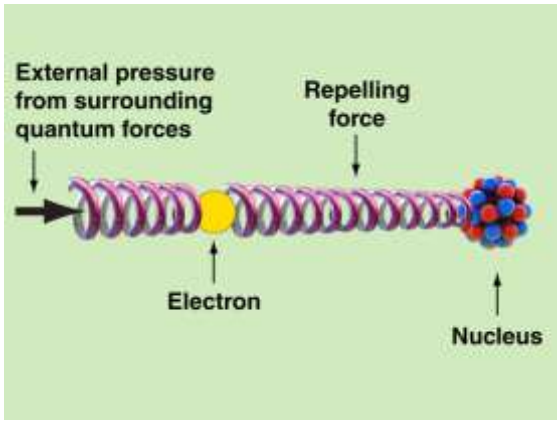
Celestial bodies

Why the difference!

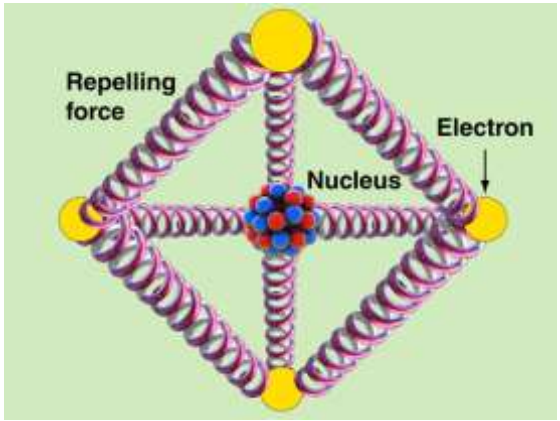
- The differences between celestial bodies and atoms can be summaries as:
  - for celestial orbits, the gravitation force must balance the centripetal force
  - for atoms, the electrons are held in orbits by their repelling forces, which are ultimately balanced by the surrounding inward force exerted by attached quantum forces—the mass and velocity of the electron is almost irrelevant.

The stability of an atom

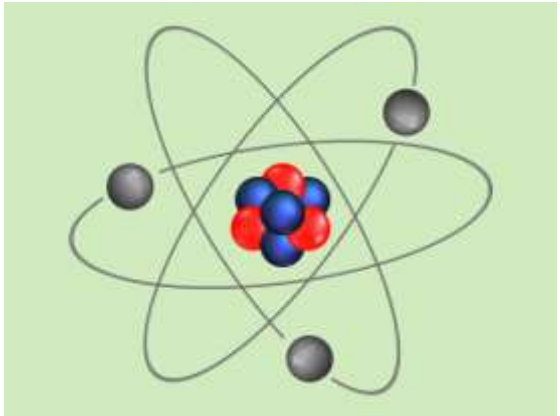
Earth and Moon (created image)



Inter-atomic forces



Inter-atomic forces for four electrons



Atom

Introduction

- In terms of their structure, atoms are very stable.
- Even though their stability is very strong, some atoms can exchange electrons with the greatest of ease without interfering with their general stability.
- On the other hand, if an orbiting moon was hit by a large meteor, then it could be lost to deep space, while at an atomic level, electrons can arrive at any speed and still be captured by an atom.

All the forces are 'repelling' forces

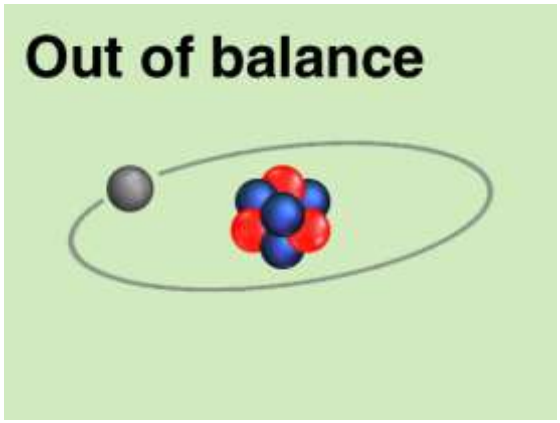
- Everything in an atom is formed from concentrated quantum forces, which have only one action, that being to repel all other quantum forces.
- So, the nucleus is formed from the same substance as an electron—there is NO positive and negative material.
- The nucleus is held as a stable body just the same as the Earth is held as a stable body—because of the inward force of the surrounding quantum forces.
- An electron is held as a stable body just the same as the nucleus.
- The nucleus wants to repel the electrons, and the electrons want to repel the nucleus, as well as all the other electrons.
- What holds the electrons in the various shells that ring the nucleus are the same repelling forces that push the Moon towards the Earth (not shown as springs in the diagram, left).
- The difference is that a centripetal force pushes the Moon outwards, while in an atom, it is the repelling force of the nucleus and the electrons that wants to push the electrons away from the atom.

The orbiting speed of electrons

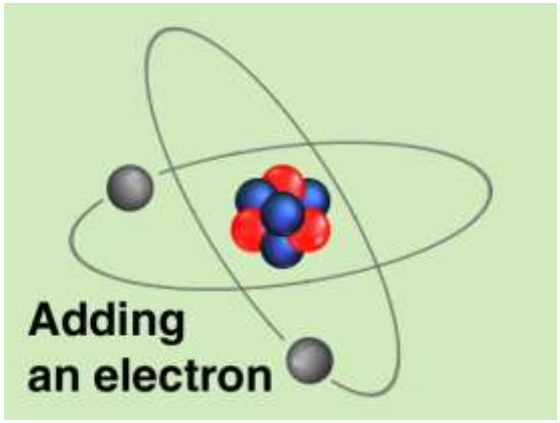
- The orbiting speed of the Moon is critical for its stability.
- However, the orbiting speed of an electron is almost completely irrelevant, except it does influence the atom's vibration.
- The orbiting speed of an electron, which must be common for all electrons within a given shell, is governed by the arrival speed of the electron, which is governed by such things as the electromagnetic activity of the material.

A vibrating atom

High school



Out of balance



Adding an electron

Heat

Introduction

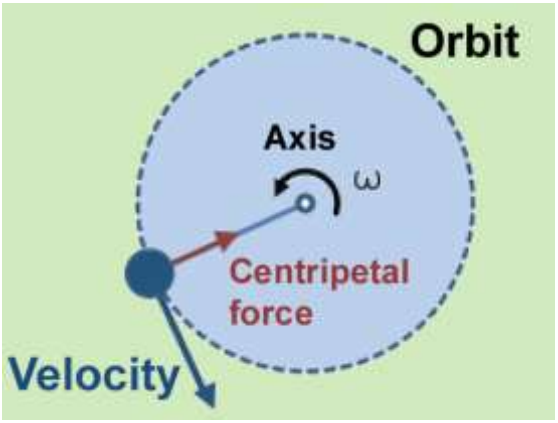
- In high school physics I heard a lot about the vibration of atoms.
- I was taught that feeding atoms 'heat' is a sure way of increasing their movement, but are they vibrating, or simply getting high on the injection of energy?

Note: In the next chapter we learn that 'heat' is a measure of the localised concentration of free and attached quantum forces.

Vibrating atoms

- Allow me to list the type of actions that could cause an atom to vibrate:
  - firstly, we should remember that the Earth and Moon do not rotate around the centre of the Earth, but around their combined centre of mass
  - similarly, an atom will vibrate around the centre of mass of the 'atom' not the nucleus
  - if an atom loses an electron, then this will:
    (i) alter the 'balance' of the atom, and therefore its vibration, plus
    (ii) cause the atom to expand in size.
  - similarly, if an atom gains an electron, then this will alter the atom's balance, and cause the atom to reduce in size
  - therefore, a rapid exchange of electrons will cause atoms to vibrate.
- The reason why an atom reduces in size when it gains an electron is because of the resulting increase in mass, which causes an increase in the external 'pushing' forces exerted by the surrounding quantum forces.
- An exchange of heat is another action that can cause atoms to change their size.
- Adding heat to an atom causes an increase in the density of quantum forces which exist within, and around, all atoms (heat is a measure of this density).
- Adding heat to a group of atoms is like pumping air into a car tyre—it makes everything expand—it causes the electrons to want to move farther away from the nucleus (however, the container that the atoms are in may prevent this expansion; say, for a gas).

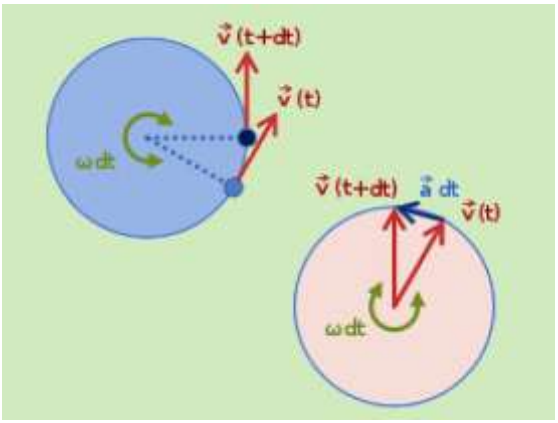
A review of centripetal forces



Centripetal force

Introduction

- In physics we learn about centripetal force, and the mathematical relationship between a central axis and an orbiting object, whether joined by a physical chord, or controlled by an externally applied force.
- The direction of this force always being orthogonal to the motion, and towards the central axis.

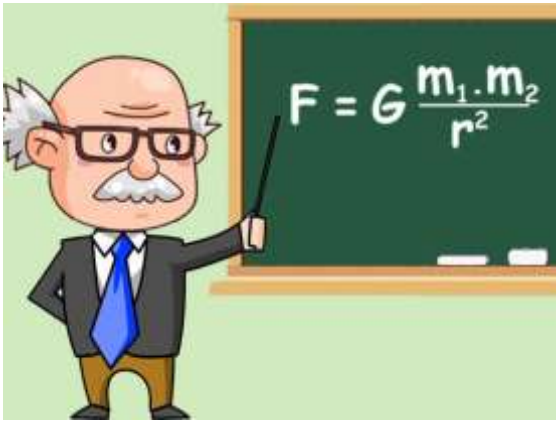


Velocity vectors

Traditional analysis

- Traditionally, physics has described this motion in terms of:
  - the centripetal force, F
  - the objects mass, m
  - the radius of curvature, r
  - the tangential speed, v
- Such that:

$$F = (m.v^2)/r$$



Gravitational equation

The strength of attached quantum forces

- The repelling force that exists between any form of matter and a distant quantum force is expected to be inversely proportional to the square of the distance of separation.
- It is expected that this force would be based on an equation similar to the gravitational force equation:

$$F = (G.m_1.m_2)/r^2$$

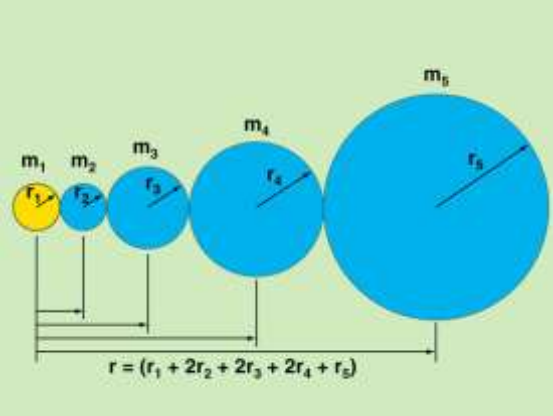
- However, this equation would need to be modified as described in Chapter 11.

Pressure

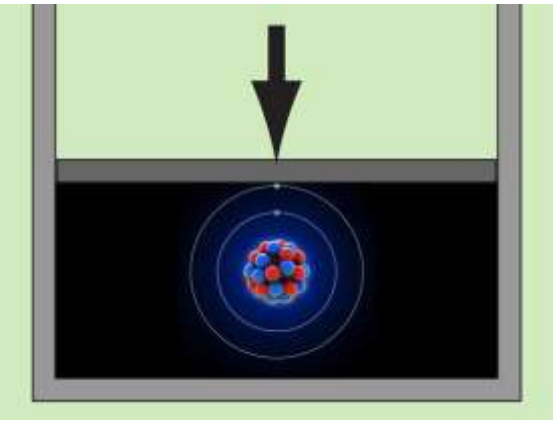
The strength of electron attachment to a nucleus

- It is assumed that the net 'attracting' force that attaches an electron to a nucleus is based on an equation similar to the gravitational equation.
- However, for an atom, the gravitational coefficient, **'G'** would:
  - not be a constant, but would be
  - a variable that is a function of temperature and/or pressure.

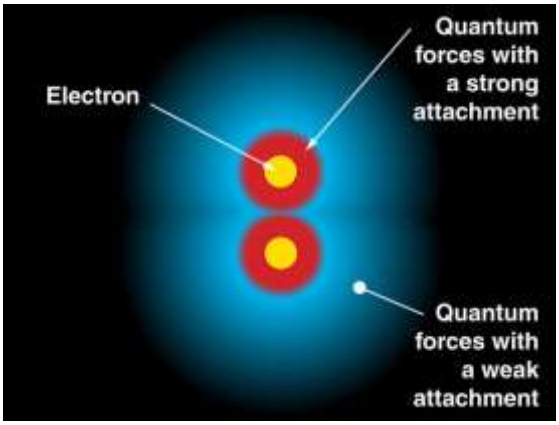
An explanation of the strong atomic interaction



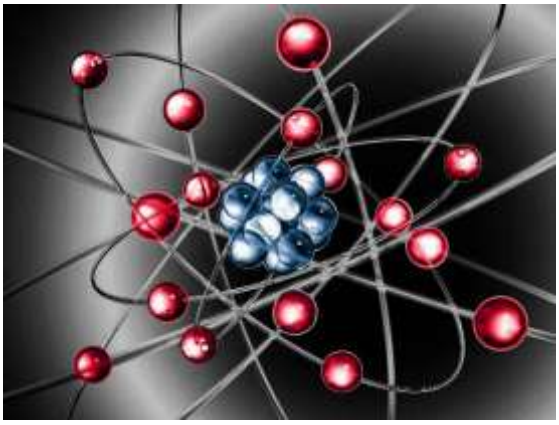
Quantum forces attached to an electron



Compressing a gas



Electrons pushed closer together



Complex atom

Atoms

- At an atomic level we have the workings of both the strong and weak interaction.
- The key to understanding these forces is to realise that as the diameter of the primary mass (m_1) gets smaller relative to the secondary mass (m_2), the inward force applied by the quantum forces increases for a given primary mass.

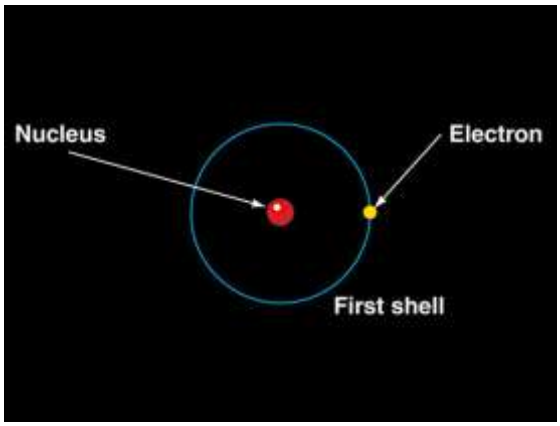
In other words, at an atomic level, size matters!

- In this case, the primary mass is either an electron or a nucleus, and the secondary mass is the attached quantum forces.
- Consequently, when a very small electron is surrounded by attached quantum forces, the resulting force of attraction is significantly different from the forces that surround a much larger nucleus.
- Electrons have a much stronger attachment of quantum forces, but they also have a significantly smaller radius of attraction, beyond which the force reverses into a repelling force.
- For an nucleon (Wikipedia):
  - *'the nuclear force is powerfully attractive between nucleons at distances of about 1 femtometre, but it rapidly decreases to insignificance at distances beyond about 2.5 femtometres'.*
- As a gas is placed under pressure, the electrons are force closer and closer to the nucleus, which increases the effective attractive force between the electron and its nucleus, which:
  - reduces the size of the attached quantum forces relative to the electron, which in turn
  - reduces the attachment of the quantum forces to the electron.

Size and stability of atoms

- The nucleus of atoms varies in size according to the type of element.
- As the nucleus increases in size, the maximum radius of attraction increases significantly.
- If temperatures, or a collision, cause an electron to bounce free of this radius of attraction, then that particular electron is released from that particular atom.

Expanding the atom from element to element



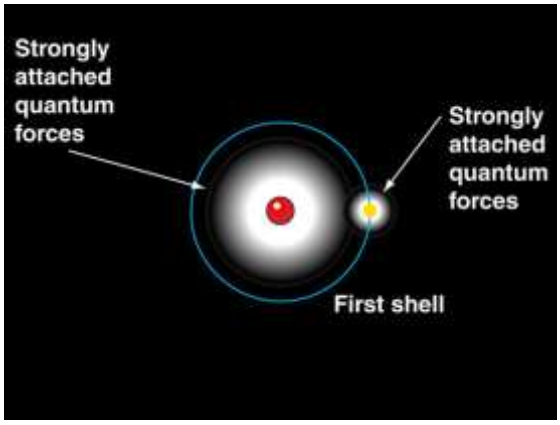
Hydrogen atom

Hydrogen atom

- The hydrogen atom is the simplest of all the elements with just one proton and one electron, and an atomic number: N = 1.
- We can let the initial radius of orbit be:

$$r = R_H$$

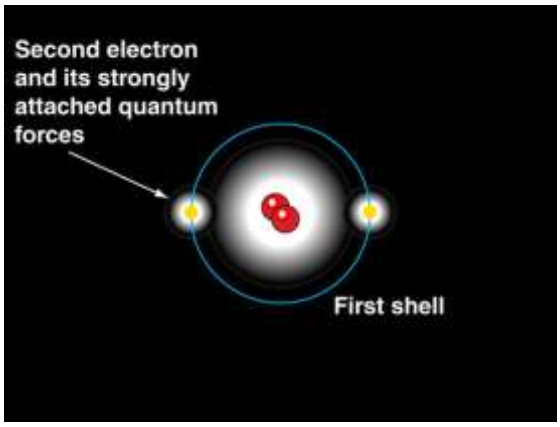
- If an electron fails to maintain its orbit it will be pushed into the nucleus.
- Once an electron approaches a nucleus, the increase in 'local' mass will alter the properties of its attached quantum forces and the electron will lose its repulsion force.



Hydrogen atom

Spacing of the first electron shell

- Both the electron and nucleus are surrounded by attached quantum forces, and it is assumed that for any given background pressure of the quantum forces (P_F), there is a certain radius of attached quantum forces that determines the radius of the electron's orbit, R_H.

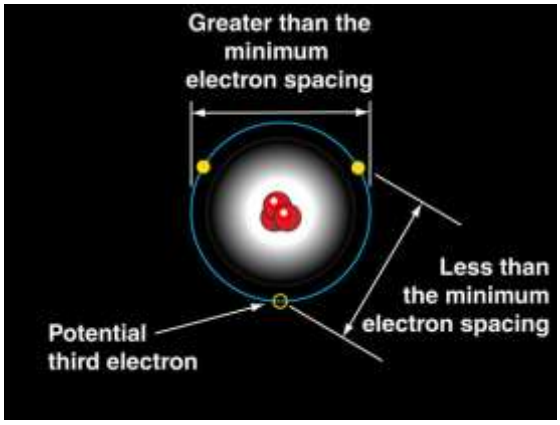


Helium atom

Helium atom

- The next element up the periodic table is the helium atom.
- As the atomic number (N) of the atom increases, there will be an increase in the gravitational attraction of the electrons to the nucleus.
- Therefore, as the atomic number increases, the radius of this first shell (r_1) reduces; similarly, as the background pressure increases, the radius also reduces:

$$r_1 = R_H.(f(N, P_F))$$

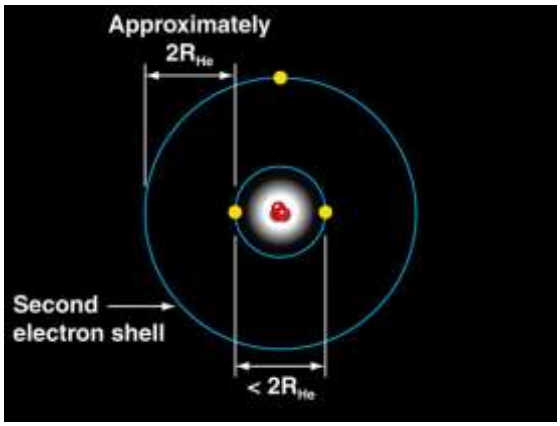


Spacing if the 1st shell held 3 electrons

A third electron will not fit

- The next element up the periodic table is the lithium atom, with three protons and three electrons.
- The third electron sits in a second shell because the first shell can only accommodate two electrons.
- This is important because it gives us an indication of the safe repelling distance of two electrons for a given background pressure of the quantum forces, which turns out to be just less than $2R_{He}$.

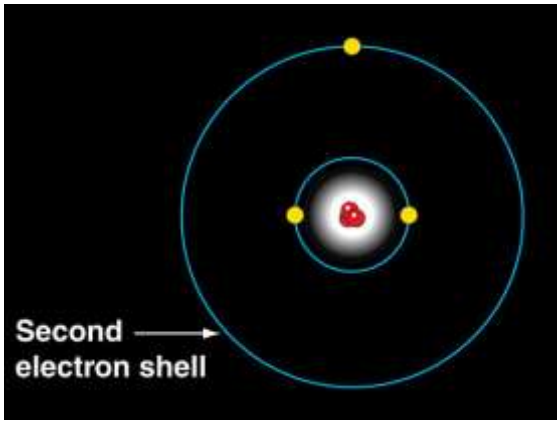
Expanding the atom from element to element



Lithium atom

Lithium atom

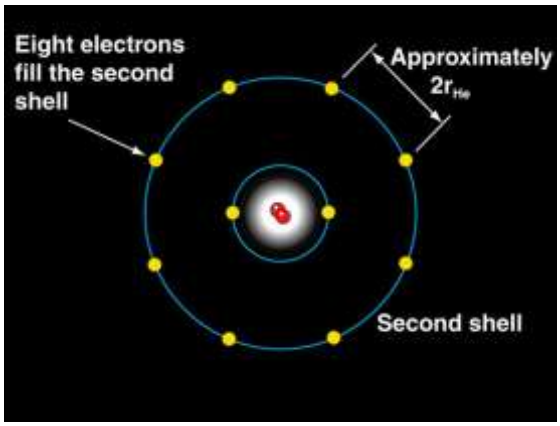
- The lithium atom's third electron must position itself on a new outer shell that needs to be approximately $2r_{He}$ larger in radius from that of the inner shell.
- However, the inclusion of an additional photon, neutron and electron causes an increase in the gravitational force, which:
  - reduces the radius of the inner shell, and
  - reduces the size of the quantum forces attached to the two inner electrons.



Lithium atom

The impact of adding this third electron

- Adding a third electron results in the following outcomes:
  - the nucleus increases in size with an added proton and neutron
  - the radius of the first shell reduces due to the increased attraction force, which could displace some attached quantum forces
  - the quantum forces attached to the electrons in the first shell will reduce in size.

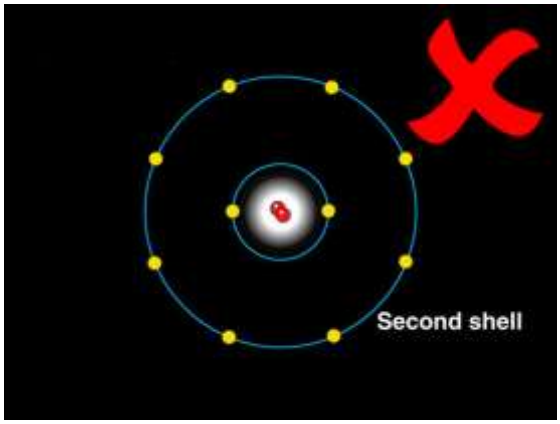


Neon atom

Neon

- The second shell is reported to hold up to eight electrons.
- Therefore, the radius of the second shell would need to be about $2.6(R_{He})$ in order to hold eight electrons at the desired separation.
- **However**, due to the increased gravitational force caused by the larger nucleus, the radius of the first shell will again be reduced.

But, would eight electrons really want to sit in a two-dimensional outer shell?

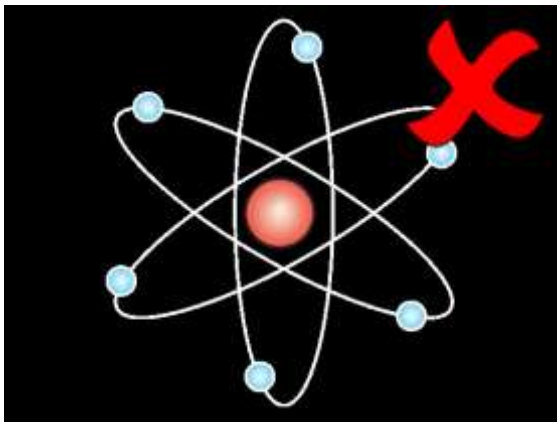


Questionable electron arrangement

Subshells and orbitals

- If the eight electrons stayed in this single 'ring', then that would make the atom act like a near-flat, two-dimensional disk.
- All it would take would be one diagonal electron-to-electron collision from an adjacent atom, and this 'flat' shell would be pushed into a three-dimensional shell with the eight electrons:
  - still maintaining their desired spacing from each other, and
  - still orbiting the nucleus.

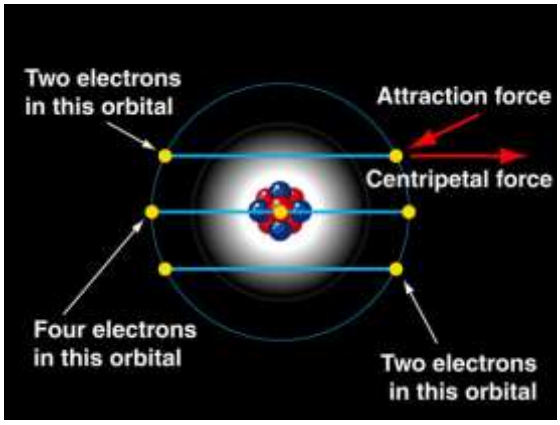
Expanding the atom from element to element



The wrong type of orbital

The wrong type of orbit pattern

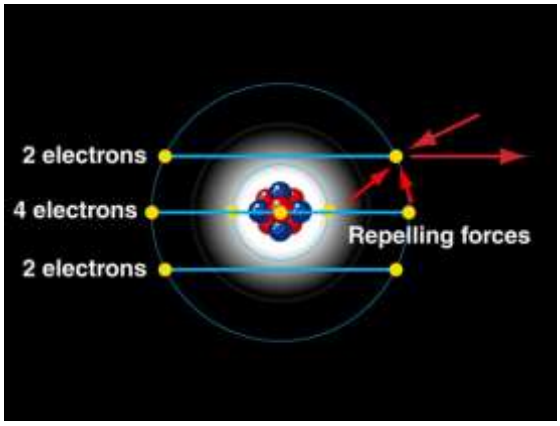
- Many diagrams display atoms in a three-dimensional form, but with the electrons potentially crossing paths, this layout would not happen.



Proposed orbitals

Orbital patterns

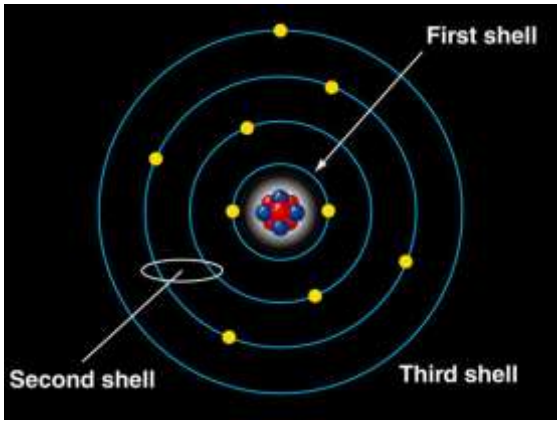
- If we tilt the previous diagrams 90-degrees we can see this second shell of eight electrons could exist as three separate orbitals (rings).
- The problem is that the centripetal force is parallel with the plane of rotation, while the attraction force is directed towards the centre of the nucleus.
- Consequently, there would 'appear' to be an imbalance in the forces acting on the electron; **but** there is a third force! (continued below)



Neon atom

Neon atom

- Unlike satellites orbiting the Earth, electrons orbiting a nucleus have a third force acting on them, that being the force of repulsion shared between all electrons.
- This third force balances the upper and lower orbitals containing two electrons each.
- Consequently, a neon atom can have a stable arrangement of four electrons in a central orbit, and four electrons shared between two outer orbitals, with all eight electrons existing in the second shell.

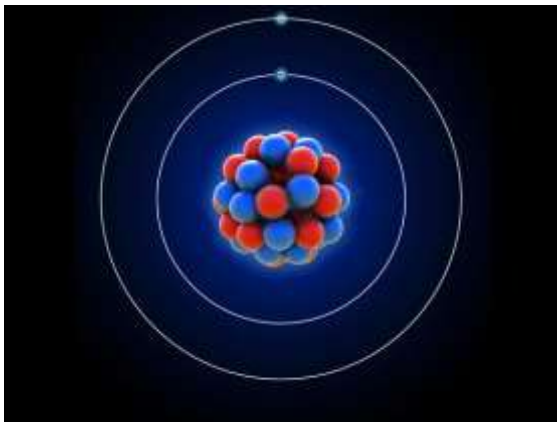


Sodium atom

Sodium atom

- The sodium atom introduces a third shell, which needs to be larger in radius than the second shell.
- The inclusion of an additional photon, neutron and electron once again causes an increase in the gravitational force, which:
  - reduces the radius of the inner shells
  - reduces the size of the quantum forces attached to the inner electrons.

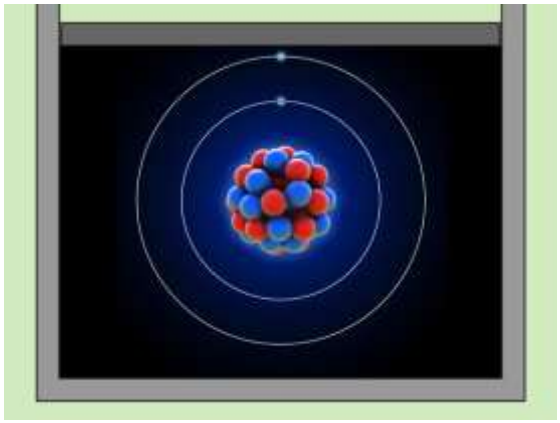
Compressing gases



An atom in space

Introduction

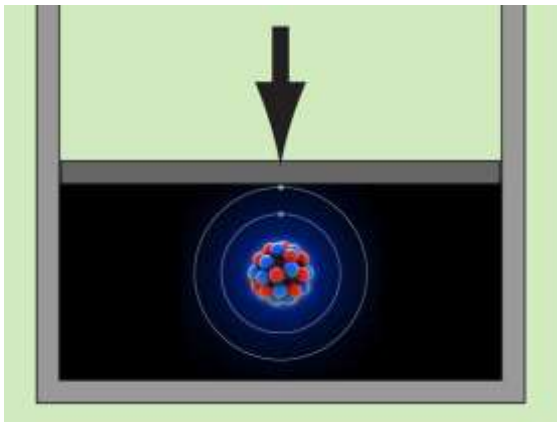
- We can think of electrons resting in shells that have a specific radius, or distance of separation, from the nucleus or other shells, but there is no specific shell radius, or distance of separation.
- Electrons can position themselves at almost any radius—it all depends on the local background pressure.
- In space, the background pressure is determined by the expansion of the universe (i.e. deep space pressure).



Representation of an air molecule

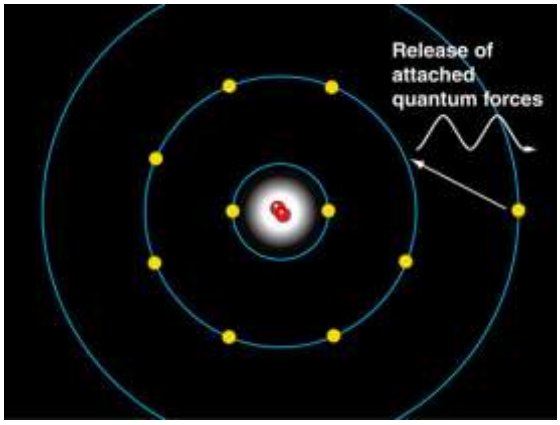
A gas locked in a container

- There is no specific temperature vs volume relationship.
- It is true that the temperature of a gas will rise if the gas is compressed, but the container can be cooled back to its original temperature leaving you with a new temperature vs volume relationship.
- Compressing a gas does three things, it reduces the radius of the electron shells, it increases the temperature, and it increases the likelihood of electron collisions.



Cooling or heating a compressed gas

- If a gas is compressed, then the radius of the electron shells reduces, which increases the density of quantum forces, which increases the temperature.
- If the shell radius is reduced, the electron's velocity is unlikely to change, but its angular velocity will increase.
- Free quantum forces can leave the container (heat exchange), which will allow a reduction in temperature, but the shell new radius stays unchanged.



The release of electromagnetic radiation

The release of electromagnetic radiation

- If an electron jumps between shells, then there will be a change in the local quantum force 'pressure' around that electron, which will change the number of 'attached' quantum forces.
- This action can allow a sudden release of free quantum forces, which would travel as a 'pulse', which would resemble electromagnetic radiation similar to a bust of light.

Lessons

There is no such thing as positive and negatively charged particles

- The existence of positive and negative forces has never been proven.
- The concept of positive and negative charged elements, and their corresponding pushing and pulling forces, was originally presented as a possible explanation of magnetism and atomic interaction.
- The force-based model of the universe tells us that these forces do not exist.

Electrons are held in their orbit by the force of gravity

- Electrons are not held in their orbit by ‘pulling’ forces.
- Electrons are held in their orbit by the same ‘pushing’ forces that generate gravity and the expansion of the universe.
- Electrons are held in a stable orbit because the forces that push the electrons towards the nucleus exceed the forces that wish to push electrons away from everything.

Electrons are held in evenly-spaced shell because of the force of gravity

- All electrons are surrounded by attached quantum forces.
- All electrons repel all other electrons.
- This repelling force limits the number of electrons that can exist within a shell of a given diameter.
- Each shell of electrons is held apart from other shells by these same repelling forces.

An increase in pressure causes a reduction in the diameter of each shell

- An increase in the external pressure experienced by matter will cause a reduction in the diameter of each shell within the atoms that form that matter.
- Reducing the shell radius (r) will increase the effective number of attached quantum forces by increasing the gravitational equation force (F), which causes an increase in the density of quantum forces within the atom, which causes an increase in its temperature (i.e. ‘heat’).

13. Heat

Introduction

An introduction to the topic

Introduction

- The purpose of this paper is to explore the viability of a force-based model of the universe.
- My principal means of testing this model is to show that the functioning of a force-based model is able to explain, in a logical manner, our observations of the universe.
- So far, my focus has been on the properties of light, mass, gravity, magnetism, electricity, time and atomic activity, but now we move onto the topic of 'heat', which is a little more difficult.

Heat

The properties of 'heat'

- If my force-based model of the universe is viable, then it must be able to explain the observed properties of 'heat'.
- The observed properties of heat include:
  - heat 'cooks' some materials
  - heat can cause 'pain' to a nervous system
  - heat can expand some materials
  - heat can accelerate the aging process
  - heat can increase the vibration of atoms.

Pressure

The properties of 'pressure'

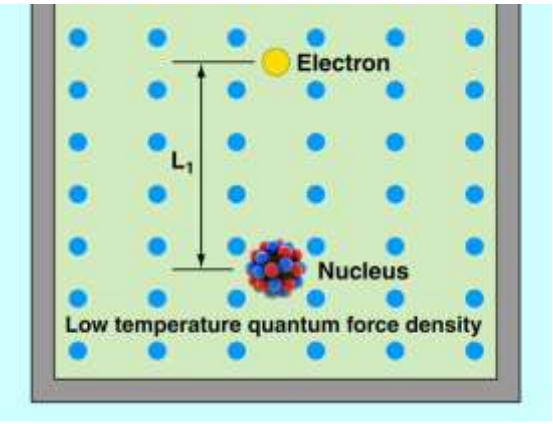
- If my force-based model of the universe is viable, then it must be able to explain the differences between the actions of 'heat' and 'pressure'.
- The observed properties of pressure include:
  - increasing the pressure can increase the heat
  - increasing the pressure, while maintaining a constant temperature, does not appear to influence the aging process (i.e. the speed of causality).

Shock wave caused by an explosion

The transfer of heat

- The mechanics and laws of heat transfer are well understood within the sciences.
- However, the laws of heat transfer are so far removed from my training and professional experience that I feel totally **unqualified** to discuss this topic.
- That said; I have spent some time trying to understand the connection between a blast shock wave, and the speed of heat transfer associated with an explosion.

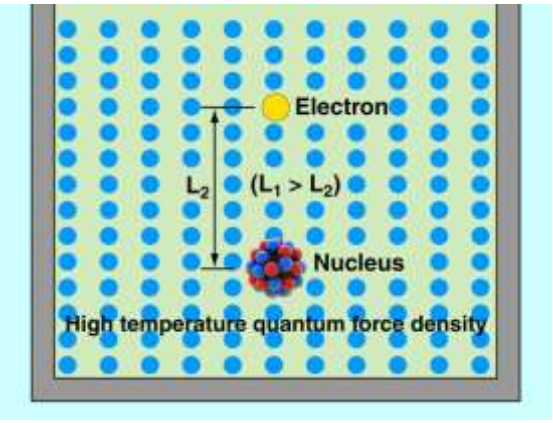
Understanding the impact of temperature and pressure changes



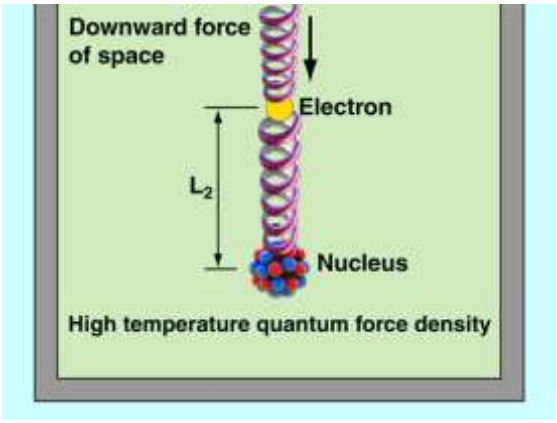
(a) Low temperature condition

The effects of temperature

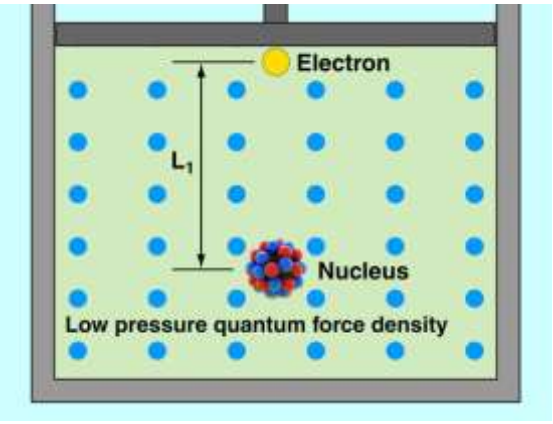
- In this series of diagrams, the blue dots represent the density of free and attached quantum forces, which I am suggesting represents the local temperature.
- If the temperature of an unconfined gas (i.e. open lid) is increased (case b), then the background repelling force will increase, which will cause all electrons to move closer to their nucleus, which will cause the vibration of some atoms to increase, which will increase the unconfined volume of the gas (or solid).



(b) High temperature condition



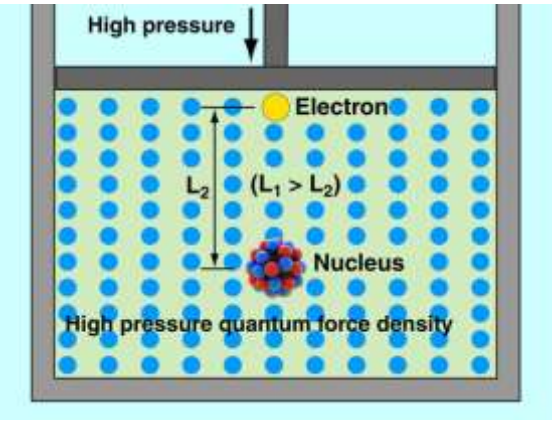
(c) High temperature condition



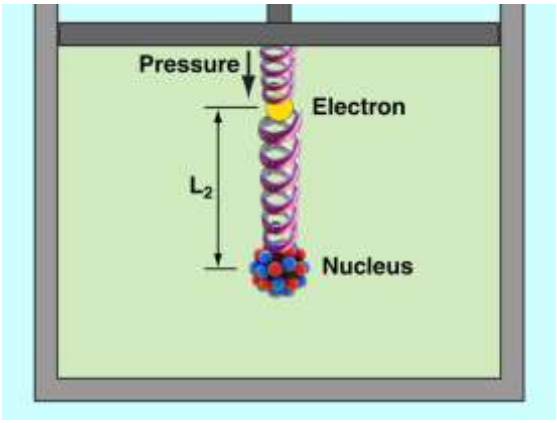
(a) Low pressure condition

The effects of a pressure change

- If the pressure of a confined gas (i.e. lid closed) is increased (case b), then the background repelling force will:
  - increase, which will cause all electrons to move closer to their nucleus, and
  - the temperature to increase, which will cause the vibration of some atoms to increase.



(b) High pressure condition



(c) The repelling forces

My theory

The outcome of heating timber

Heat

- It is my belief that:
  - heat is a measure of the density of free and attached quantum forces
  - heat transfer is the net movement of free and/or attached quantum forces.
- What makes 'heat transfer' different from 'magnetism' is that in a heat transfer, the process must result in a change in the density of free and/or attached quantum forces, where as in magnetism, the density remains near constant.

Friction-induced heat

Heat generated by friction

- The action of 'friction' causes free quantum forces to be pushed into the material that is being heated, which in the case of a car's braking system, would include both the disc and the brake pads.
- The heat exchange is represented by the flow of free quantum forces, which increases the background density of quantum forces within the various materials.

The heat of an engine turbocharger

Heat generated by pressure

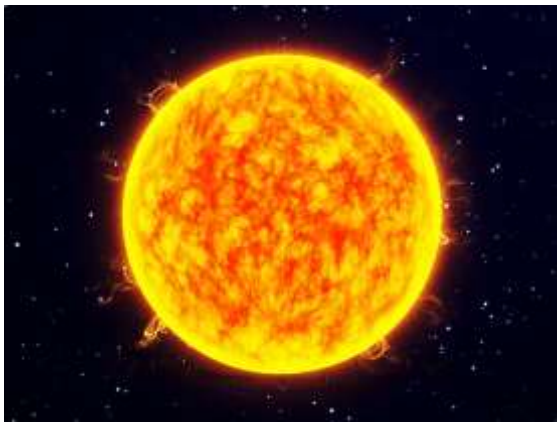
- Increasing the pressure of a gas will cause an increase in the local concentration of free quantum forces, which causes an increase in the local temperature.
- This increase in the concentration of free quantum forces within the gas can lead to an increase in concentration of free quantum forces within the surrounding container (in this case, the turbo charger casing).

Atomic explosion

Heat generated by an explosion

- During an explosion, very small amounts of physical matter are converted to free quantum forces, which disperse (as a shock wave) at a velocity that is less than the speed of light, but greater than the speed of sound.
- This action causes a localised increase in the density of free quantum forces, which causes an increase in temperature, which moves with the shock wave.

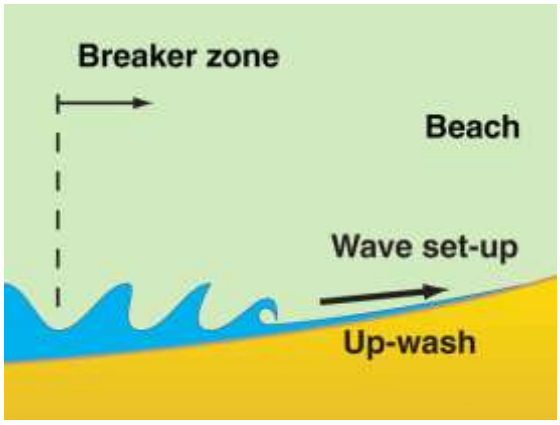
My theory



The Sun

Heat generated by sunlight

- Light travels as a compression wave of quantum forces.
- Light does not travel as heat.
- No ‘heat’ actually leaves the Sun.
- When sunlight hits physical matter, such as a gas, liquid or solid, the pulse of compressed quantum forces causes a localised increase in the background density of quantum forces, which causes a localised increase in temperature.



Wave set-up on a beach

Wave set-up on a beach

- To understand this pulse action, consider waves hitting a beach.
- When the pulse of regular ocean waves strikes a beach, there is a transfer of water pressure, which causes the mean water level on the beach to be higher than the mean ocean level.
- This effect is known as ‘wave set-up’.
- For similar reasons, when the pulsing action of sunlight hits physical matter, there is a transfer of energy, which causes an increase in the local temperature.

Electrical current

Heat generated by an electrical current

- The flow of electricity represents a flow of physical matter (electrons), which induces a flow of quantum forces.
- If this flow of electrons does not meet any resistance, then there will not be a transfer of free quantum forces, and thus no change in heat.
- However, if the flow meets resistance, then this resistance will exist in a form that causes the exchange of quantum forces, which causes an increase in heat.

Burning match

The sensation of heat

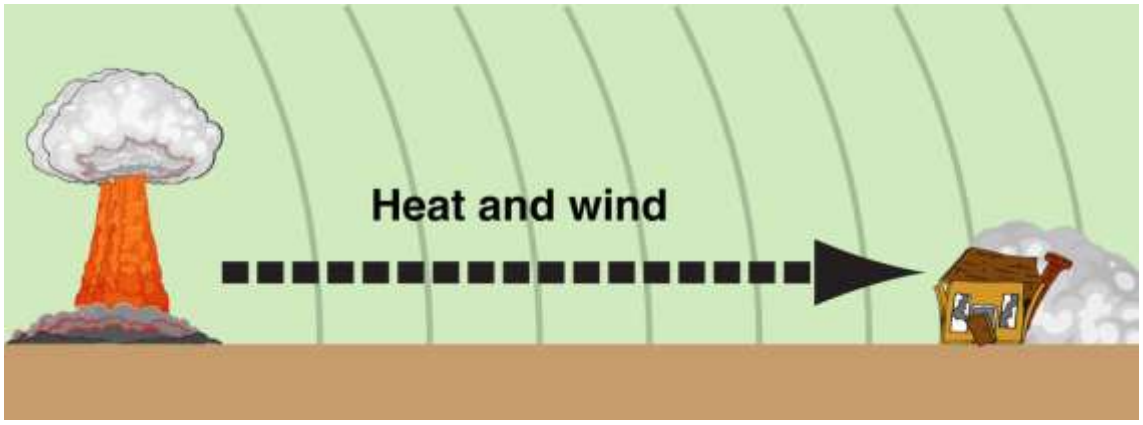
- The sensation of heat is felt through:
  - our sense of touch, and
  - our nervous system registering changes to the structure of the body.
- A localised source of heat will cause a localised increase in the speed of causality, which will increase the rate of all actions, which can increase:
  - the rate of chemical reactions
  - the rate of oxygenation of the material
  - the rate of ‘aging’ of the material.

The movement of a shock wave (returning to an earlier discussion)

Explosion shock wave (not atomic)

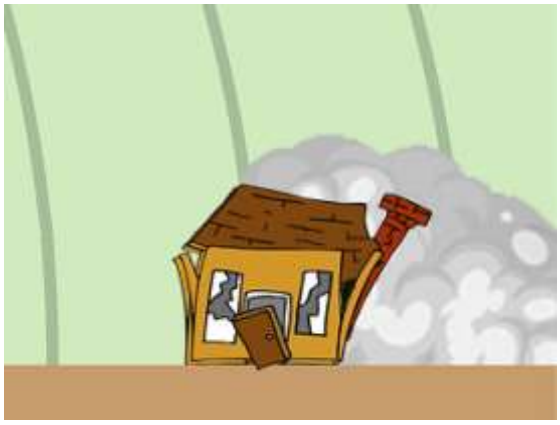
Introduction

- When an atomic blast occurs, distant objects very quickly experience a rapid increase in heat, air pressure, and wind velocity, but what are the physics involved in this rapidly changing event?
- Understanding the movement of the air, heat, sound, and air pressure, can help us to better understand the properties of fluids.
- And, we need to understand the properties of fluids in order to understand the physics of our universe.



The effects of an atomic blast

Atomic explosion

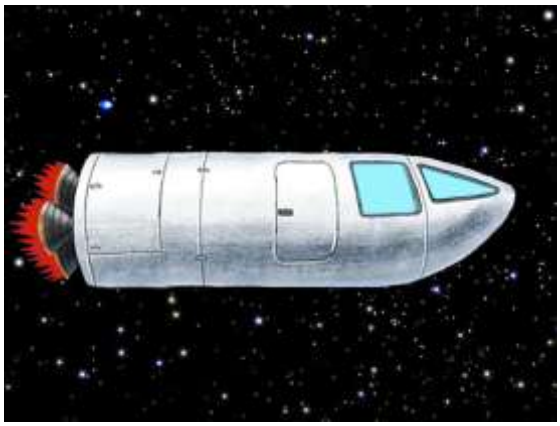


Damage to a distant house

Outcomes of an atomic blast

- The 1st action to arrive at a distant building would be the visual evidence of the blast, which travels at the speed of light in air.
- The 2nd action to arrive would be the heat from the blast, but how does this heat arrive so quickly?
- The 3rd action to arrive would be the combined pressure wave and sound, which travels at the speed of sound in air.
- The 4th action to arrive would be the wind, which would likely commence immediately after the arrival of the shock wave, but this air (wind) would not have travelled from the blast site.
- So, what caused the heat to travel so fast?
- Some may tell you that the heat is produced by the severe compression of the air associated with the sound wave.
- But heat is a measure of the compression of quantum forces, and it is noted that the atomic blast just converted a small amount of matter into a massive amount of quantum forces, which travels as a shock wave.

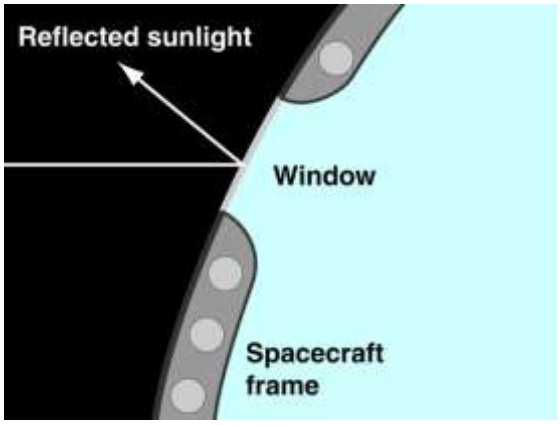
Heat exchange with a spacecraft



Spacecraft

Introduction

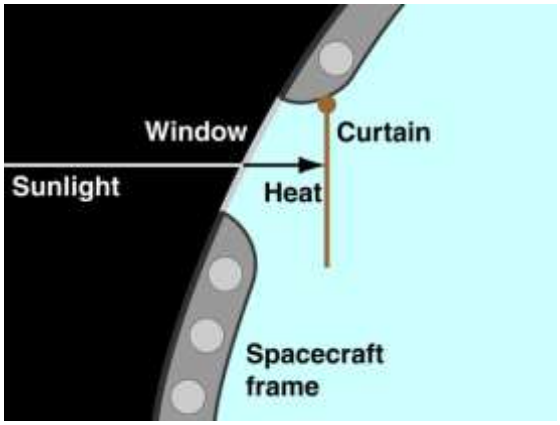
- Both the Apollo and Artemis II spacecrafts had windows, which allowed sunlight to enter the capsules.
- Depending on what and where this sunlight struck physical matter, there was a different type of heat exchange.



Heat reflection on the window

Heat transfer through a window

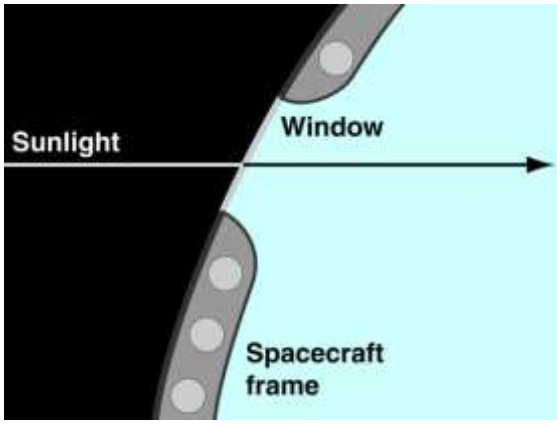
- Any sunlight that strikes a spacecraft has the potential to generate heat.
- If a reflective film is placed on the <u>outside</u> of a window, then the potential for generating heat is reduced.
- If a reflective film is placed on the <u>inside</u> of a window, then heat will be generated within the glass, but this heat can radiate into the capsule's outer structure and dissipate.



Light hitting an internal curtain

Sunlight striking an internal 'curtain'

- If the sunlight passes through the window and hits an internal object, such as a curtain, then heat will be generated <u>within</u> the cabin, and potentially stay within the cabin for a longer period of time.



Light hitting internal fixtures

Light hitting internal fixtures

- If the sunlight passes through the window and hits an internal object that is structurally connected to the capsule's metal frame, then the heat generated within the cabin can quickly dissipate through the capsule's outer structure to the cool (i.e. dark side) of the spacecraft.

But here is the question for readers to think about. Where does all this heating of the capsule ultimately go? How does 'space' cool a spacecraft? What is the physics?

The stratification of temperature layers

Temperature

Introduction

- When we heat a room, there is generally a good flow of the heat, and a near-uniform temperature will be achieved within a single room on most days.
- However, when we add more hot water to a bath, we need to mix (stir) the water in order to spread the warmth evenly.
- So, sometimes heat spreads fast, and sometime it needs a little help.

The flow of heat

The movement of heat

- As briefly discussed earlier, 'heat' represents a measure of the density of free and attached quantum forces.
- Therefore, heat transfer represented a net exchange of quantum forces resulting in a localised change the density of quantum forces.
- Now, free and attached quantum forces cannot move without the movement of physical matter, so if the matter isn't moving, then neither is the heat.

Stratification based on fluid density

The stratification of lakes

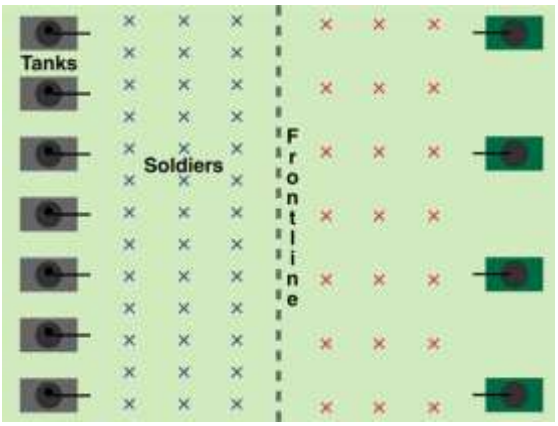
- If a water body contains layers of water that have different levels of heat, then rather than the heat dispersing, it can be retained within each layer of water.
- This effect is known as 'stratification'.
- But note; within a given layer of water, which may be 1 meter or more thick, there will be an almost uniform water temperature (i.e. good mixing).
- This even distribution of heat within a given layer of water results from Brownian motion.

Water supply dam

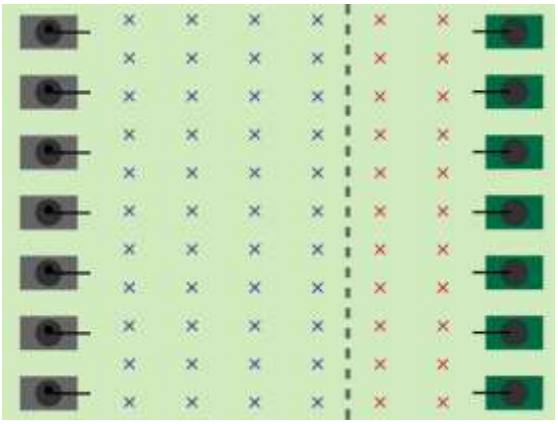
The cause of stratification

- What causes the stratification of water layers, and air layers, if the lack of particle movement between the layers.
- The only way that there can be an exchange of free and attached quantum forces, and thus a change in the density of these forces, is for there to be movement of physical matter (i.e. air or water particles).
- Thus, heat transfer requires water flow or air flow, consequently, stratification only occurs in still water.

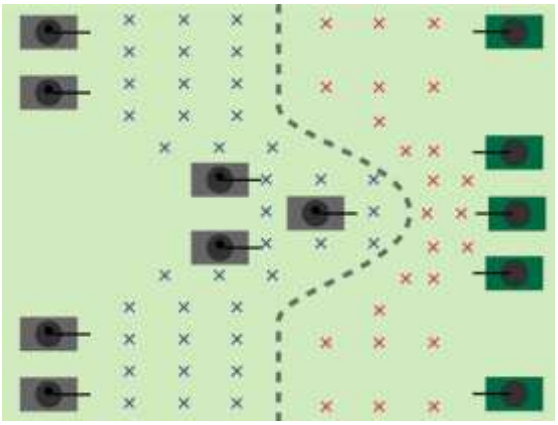
Heat transfer



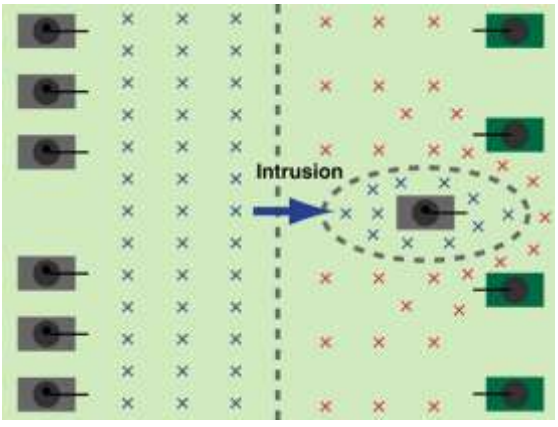
Stratification



Heat transfer



General movement of matter



Intrusion of matter

Introduction

- Welcome to the strange mind of the author where he attempts to describe heat transfer in terms of a European WW2 battle.

Stratification

- Temperature stratification occurs when the physical matter (the tanks) is/are still, and no side wishes to make any advances even though the forces are stronger on one side compared to the other.
- Unless the tanks move, the ground troops (quantum forces) stay in their positions.

Heat transfer

- In order for heat transfer to occur, there needs to be general movement (flow) within the layers, and this general movement will, metre-by-metre, yard-by-yard, transfer heat (quantum forces) from one side to the other.
- What one side loses in captured soldiers, the other side gains in captured prisoners (Yes I agree; it is not the best analogy).

Jetting or radiation

- A concentration of movement on one side can cause an intrusion, which will generate a response on the other side.
- This is equivalent to the 'Battle of the Bulge' event that occurred on the Western Front in WW2.

Intrusion of hot matter

- Only when matter (artillery) enters a region will the attached quantum forces (the soldiers) be willing to follow.
- Such actions will also generate a response (increased concentration of quantum forces) on the other side.
- In the science of heat transfer, once a soldier crosses the battle front, it now begins to fight for the other side—**Note:** in this analogy, 'heat transfer' represents a transfer of soldiers, not tanks.

Lessons

Heat is a measure of the concentration of free and attached quantum forces

- Heat is <u>not</u> a product of the vibration of atoms.
- Heat is a measure of the concentration of free and attached quantum forces.

Heat transfer occurs only as a result of an exchange of quantum forces

- A flow of quantum forces generates magnetism.
- In an ideal material, there is minimal resistance to the flow of quantum forces, which means the concentration of quantum forces within the material remains as a constant.
- Heat transfer only occurs when the resistance force causes an increase or decrease in the density of quantum forces.

Temperature stratification cause

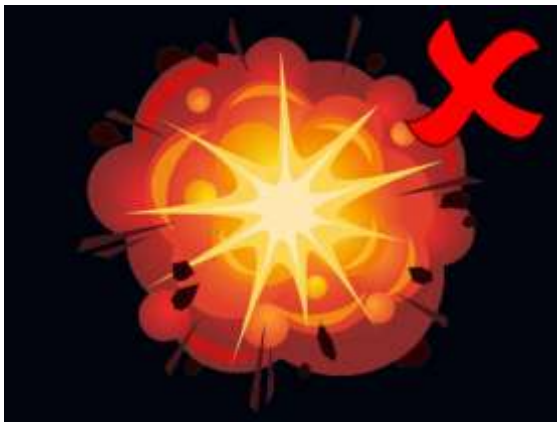
- The transfer of heat is normally controlled by the temperature gradient; however, this action does not explain the occurrence of stable temperature gradients (i.e. temperature stratification).
- Heat transfer can only occur if there is an exchange of physical matter because attached quantum forces do not move without movement of matter.
- In a ‘still’ fluid, the quantum forces are prevented from moving, which slows heat transfer.

The ‘heat’ of an explosion is transported by the shock wave

- An explosion creates the rapid displacement of matter, which ‘injects’ quantum forces into the surrounding air.
- The heat of an explosion is generated by the increase in density of quantum forces within the background media (usually, air).
- Shock waves travel at a speed less than the speed of light, but much greater than the speed of regular heat transfer.

14. The Big Bang

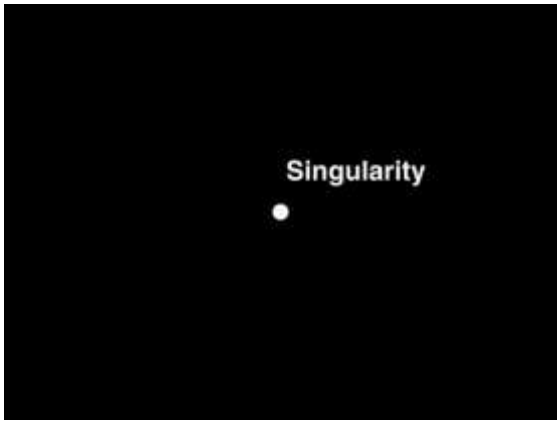
The big expansion



Not an explosion

Introduction

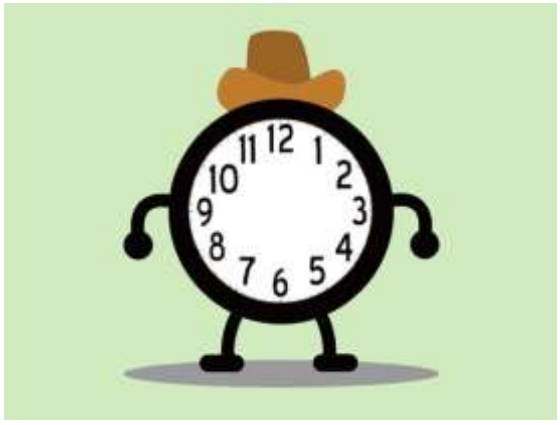
- When most people think of the Big Bang, they picture a chemical explosion, just like an explosion they have personally witnessed, or seen in a movie.
- But, the Big Bang was not a chemical explosion, it didn't even make a 'bang', it was a rapid expansion—an expansion that continues today.
- The initial speed of the expansion is debatable, but most experts believe it was very rapid.



Singularity

Singularity

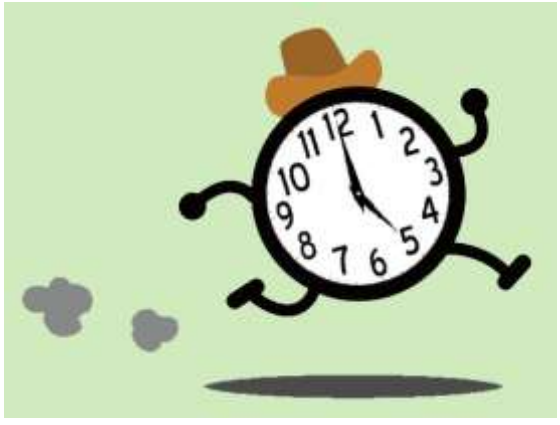
- Within this paper it has been suggested that the sole product of the Big Bang was an entity that the author has chosen to call 'quantum forces'.
- A quantum force has the property of mass, which is generated by the speed of causality, but it has no physical existence, and therefore, no fixed dimensions.
- A singularity also has no mass because the speed of causality within the singularity is zero, thus preventing the generation of the effects of 'mass'.



Stationary time

The speed of causality

- Within this paper it has been proposed that the speed of causality is inversely proportional to the density of free quantum forces.
- This means that within a singularity, the speed of causality would be zero.
- If time is just a consequence of actions, and the speed of an action at an atomic level is governed by the speed of causality, then the 'rate of time' would also be zero within a singularity.



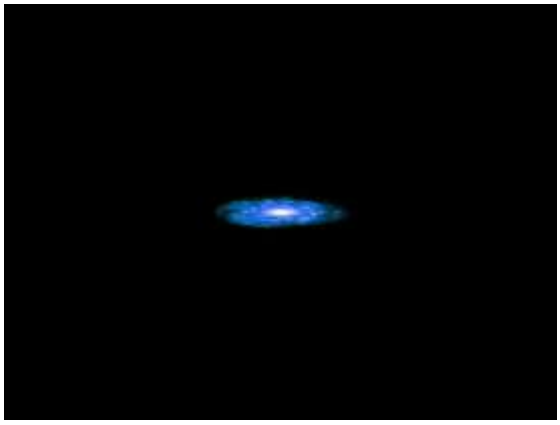
Time commenced 'running'

Initial expansion

- So, this suggests that time was stationary while the singularity existed, which would have made the singularity stable.
- For whatever reason, a single quantum force moved away from the singularity, which would have initiated the 'speed of causality' and 'time', which in-turn allowed this movement to occur.
- So, the speed of causality would have started from zero, and then increased in association with the ongoing release (and density) of quantum forces.

Expansion from a singularity into a disc-shaped universe

Singularity



Initial expansion

Expansion in two dimensions

Expansion in three dimensions

Introduction

- One of the many outstanding questions in astrophysics is: *Why did the universe expand primarily across a two-dimensional plane, rather than expanding equally in all three dimensions?*
- In order to propose an answer to this question, it is first necessary to think very carefully about what the structure of a singularity.

A difficult concept to imagine:

- I imagine that it is difficult for people to picture the stacking of an infinite amount of quantum forces into a singularity.
- It is difficult to think of an expansion of quantum forces that would not spread equally in all three dimensions, but that is because we humans would always imagine the Big Bang as being like an explosion, not an expansion.

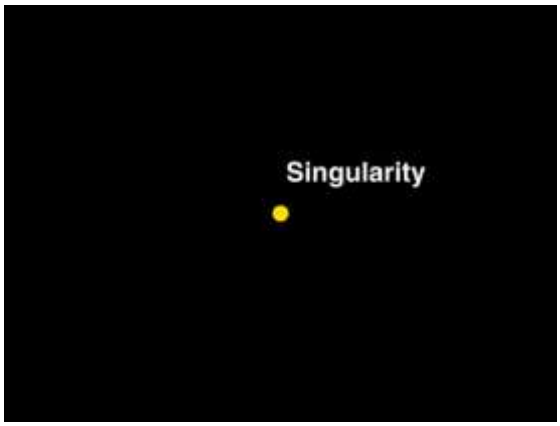
The expansion of a singularity:

- When we think about a singularity it is very important that we do not think of the quantum forces being very tightly packed into a grid-like structure.
- There is no three-dimensional form within a singularity.
- The existence of a singularity means that all of the expanding quantum forces are, in effect, clones of each other.
- This means that in whatever manner one quantum force moved, all quantum forces will want repeat the same movement (expansion).
- Consequently, the expansion of the universe would have initially occurred, or wanted to occur, in one dimension.

The creation of a 3D universe:

- The creation of 'spin' would have converted this 1D expansion into a two-dimensional expansion.
- The gradual expansion of this two-dimensional plane into a three-dimensional universe would have been caused by collisions, which were ultimately caused by the non-uniformity of the universe.
- Non-uniformity occurred because force messages arrived at different locations at different times.
- A non-uniform universe results in chaos, which results in collisions, which results in the expansion of the universe in three dimensions.

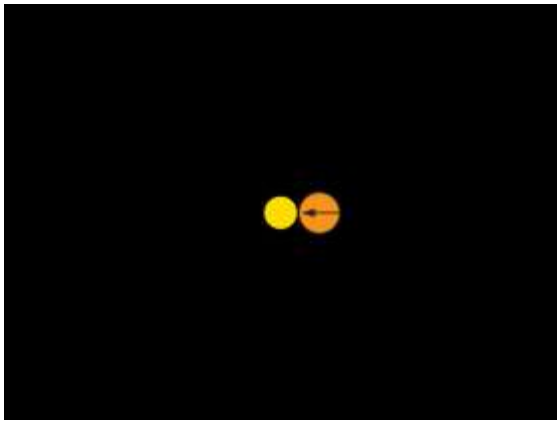
What <u>could</u> have caused the universe to start spinning



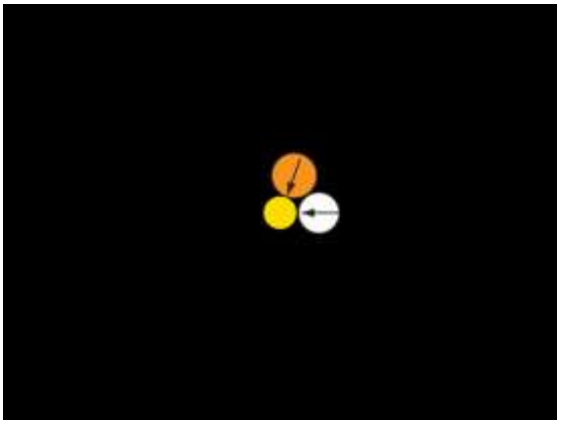
Original singularity

The following is just one possible cause of a spinning universe.

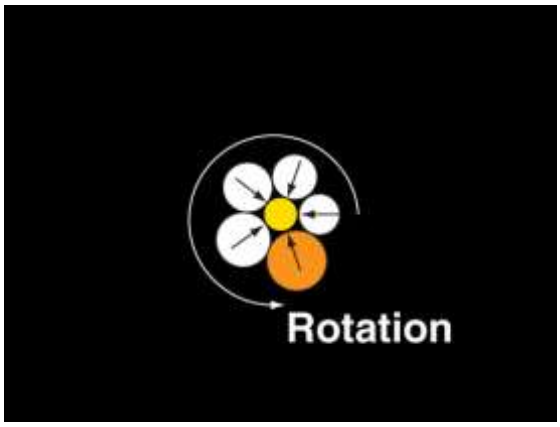
- The first quantum force is released.
- The second, and subsequent quantum forces try to move along the same trajectory, which caused the previous quantum forces to move (rotate) out of the way of subsequent releases.
- Remember; all quantum forces want to repel all other quantum forces.
- The expansion continues to grow with all quantum forces staying in contact as they push off each other.



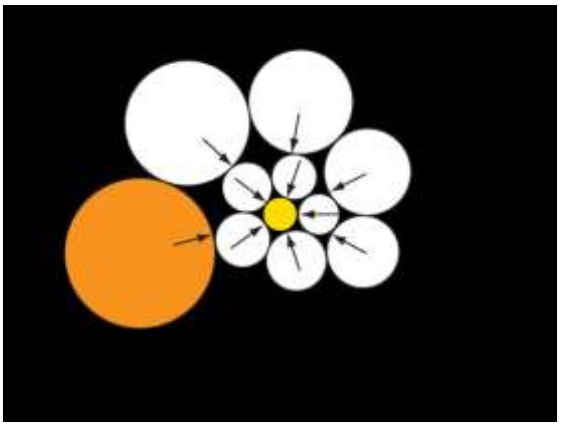
Release of the first quantum force



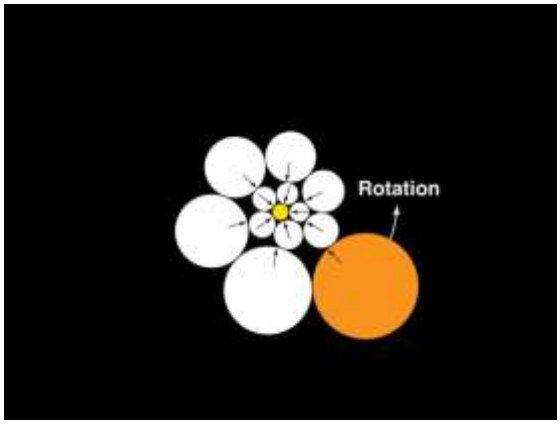
The 1st quantum force is coloured orange



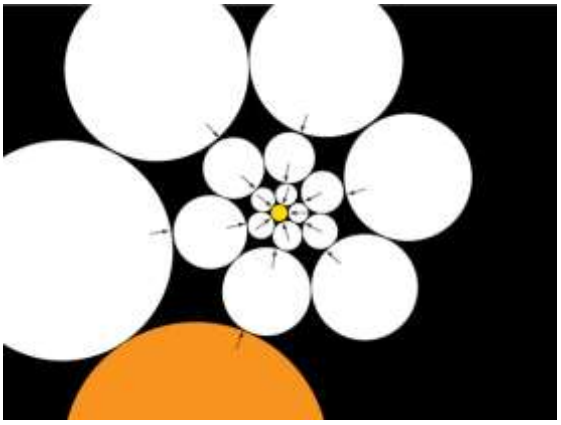
Expansion causes rotation



Released quantum forces expand is size

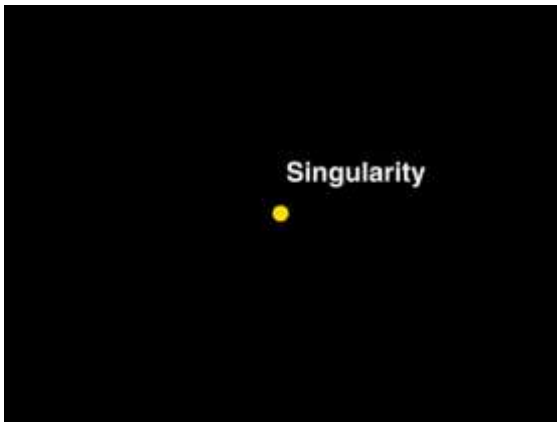


This action could be very fast, or slow



Ongoing expansion

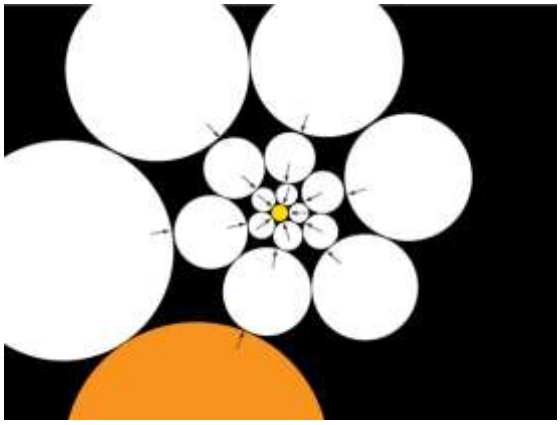
The changing rate of time



Original singularity

Introduction

- I accept that I have a completely different view of the timing of the Big Bang from that of currently (2026) accepted theories—and I am happy to be proven wrong.
- I believe that ‘time’ does not exist as an independent variable.
- I believe that ‘time’ exists as a consequence of the speed of causality, and that the speed of causality, and therefore the rate of time, is/was zero within the singularity.



Early expansion of the universe

Initial expansion

- Because the speed of causality was zero within the singularity, actions by the singularity were extremely slow, and the singularity appeared to be very stable.
- Consequently, the release of quantum forces may well have been a relatively slow process.
- Time outside the singularity would be inversely proportional to the density of quantum forces, which was constantly ‘decreasing’ as expansion occurred.

Earth

Earth today

- The rate of time that we currently experience (Earth time) is inversely proportional to the density of quantum forces that currently exist within our galaxy.
- This rate of time will increase as the universe continues to expand; however, given the current enormous size of the universe, any changes to the rate of time during the existence of humans, would be infinitely minor.

Edge of space

Edge of space (today)

- The density of quantum forces across the universe would not be uniform.
- At the centre of the universe, the original singularity could still be releasing quantum forces.
- It would seem to me to be completely implausible for the rate of time, and the speed of light, to be constant across the universe.

15. Errors in our Current Understanding of the Universe

Potential errors made by past researchers

Caution!

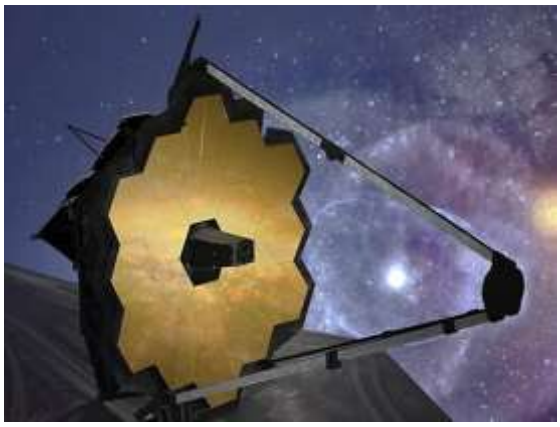
Introduction

- As humans, we base our understanding of the environment on our observations and the feedback from our five senses.
- However, our brain can fool us to believe things that are not exactly true, for example, when we see ‘stop-motion’ video, our brain registers this as smooth, continuous movement, but it isn’t.
- Similarly in astrophysics, our brain can also lead us to believe things that are not exactly true.

Space

Einstein discussed ‘light’ in a vacuum

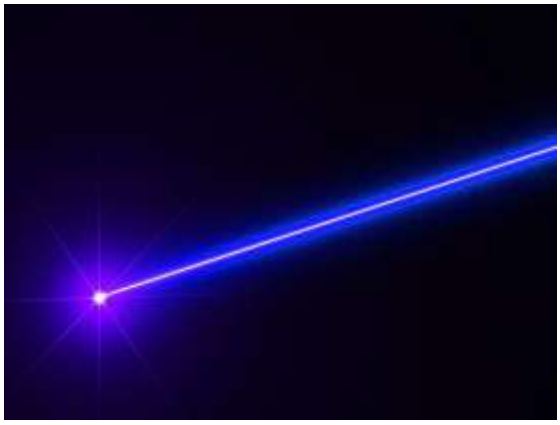
- I do not know how Einstein would have defined a ‘vacuum’.
- Did he consider a vacuum to be a region of space that contains no physical matter?
- Or did he consider a vacuum to be a region of space that contains nothing at all, i.e. a true vacuum?
- But we know that space is not empty because science has detected gravitational waves, which I know cannot move through a true vacuum.



James Webb Space Telescope

There could never be a vacuum in space

- The Big Bang didn’t explode isolated bits of energy into space.
- The Big Bang was an expansion of an almost endless quantity of ‘something’, which formed the continuous substance of space.
- There is no point in space where the James Webb telescope would not be able to see billions of stars, which means billions of stars are sending information (photons) to that location—so, every location in space must have photons.



Light

The speed of light is not a constant

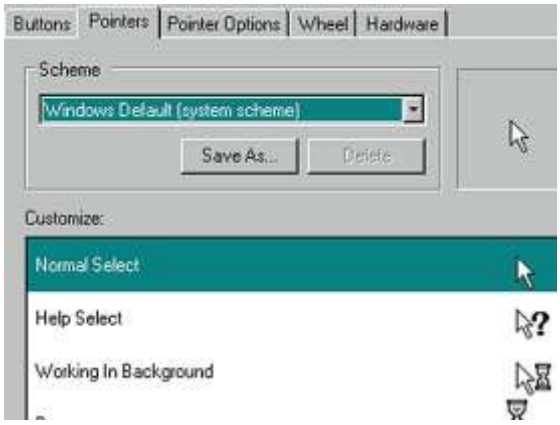
- Einstein suggested that light has a constant speed in a vacuum.
- Einstein was not suggesting that the speed of light is the same within all media.
- I will put it to you that:
  - light cannot exist in a true vacuum
  - light cannot travel through a true vacuum
  - the speed of light varies inversely with the density of the substance that fills space.

Potential errors made by past researchers

Speed boat wake

When a wave is not a wave

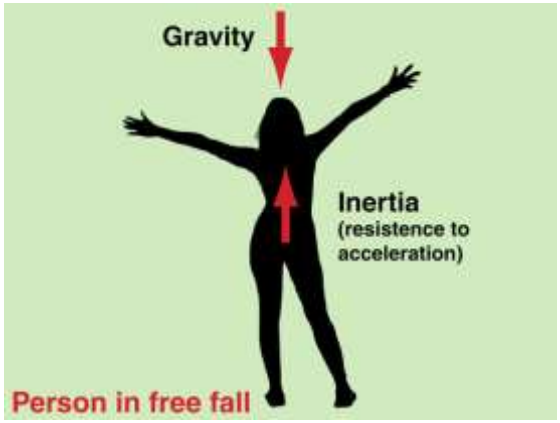
- There has been a lot of research dedicated to finding out if light travels as a particle, or as a wave.
- I will put it to you that every particle of matter creates waves when it moves through a fluid, but that does not make every particle of matter a ‘wave’.
- Boats generate waves, but boats aren’t waves.
- Light can only exist when it is moving, and when it moves it generates waves, even when it moves through space.



Computer screen pointer

When a ‘particle’ is not a particle

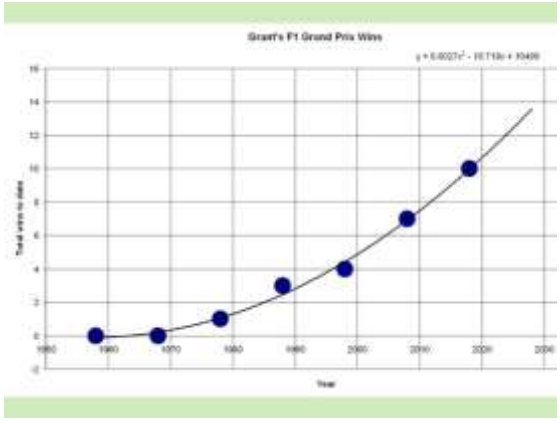
- Is the ‘pointer’ on your computer screen a particle?
- When you move a pointer across a screen, does the pointer physically move, or does it just appear to move?
- If we define a particle as any form of concentrated energy, aether, or forces, then light is a particle, but if we define a particle as physical matter, then light is not a particle, it is just a compression wave of whatever fills space (i.e. energy, aether, or forces).



Person in free fall

A person in free fall

- Einstein believed that a person in free fall is not subjected to the force of gravity:
  - he believed that gravity was not a force
  - he believed that a falling person cannot feel the actions of gravity.
- However, the reason we cannot feel the force of gravity is because gravity is an internal force, acting on each individual atom in our body; it is not an external force acting on the surface of our body—Einstein was wrong!

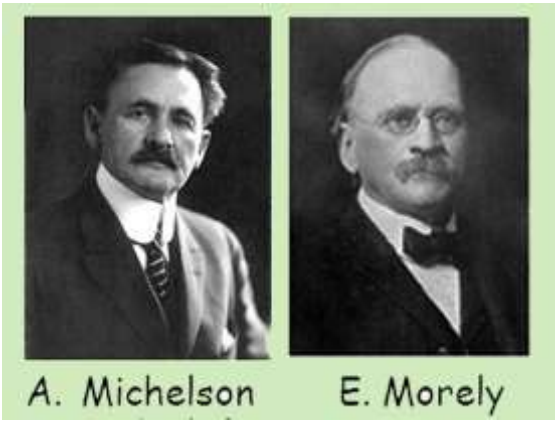


A plot of false data

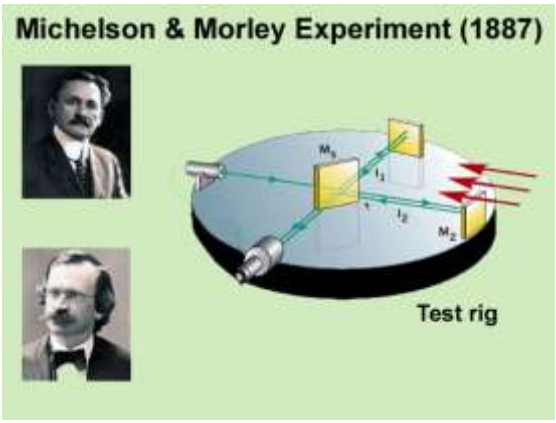
Proving a theory with mathematics

- But you say: *They proved Einstein’s work with mathematics.*
- Well, this graph plots the number of International Formula 1 Grand Prix wins achieved by the author over his lifetime.
- The ‘data’ is complete rubbish!
- However, a mathematical equation has been fitted to this rubbish data.
- Good mathematics cannot turn bad data into good data, or bad idea into good idea.

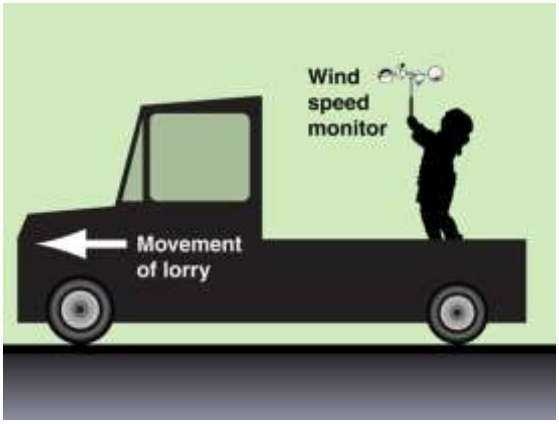
The Michelson–Morley experiment



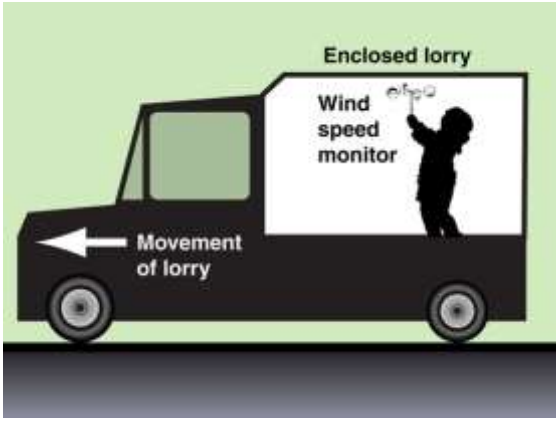
Albert Michelson and Edward Morley



Michelson–Morley experiment



Open lorry



Covered lorry

Introduction

- In the 1800s an idea existed that a supporting medium permeated space, through which light travelled.
- Sometimes referred to as ‘aether’, or ‘luminiferous aether’.
- In 1887, American physicists Albert Michelson and Edward Morley conducted an experiment that concluded that such a medium did not exist.
- This outcome opened the door for the acceptance of a vacuum in space, but I believed that they were wrong!

Michelson–Morley experiment

- The Michelson–Morley experiment looked for evidence that the speed of light was affected by the speed of the Earth travelling through this aether.
- No effect on the speed of light was found, thus concluding the non-existence of an aether-filled space.
- BUT, there was a problem with how they conducted their experiment!

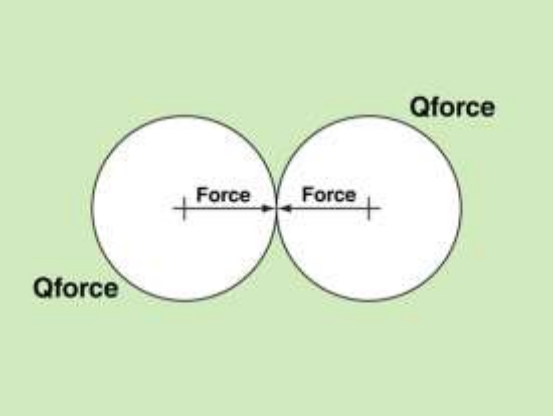
Testing the existence of ‘air’

- Consider what would happen if someone wanted to test for the existence of ‘air’.
- Such a test could involve a person standing in the back of an open lorry, while holding a wind speed monitor.
- If the lorry is moving through a medium of air, then the wind speed monitor should be able to detect the movement of air relative to the lorry.

The test experiences a problem

- However, on the day of the experiment the researchers were only able to hire a fully enclosed lorry.
- They conducted the experiment, but they found that the wind speed monitor did not detect any air movement, so they concluded that a medium of air did not exist!
- But the problem is that while they were inside the covered lorry, the air was effectively captured by the lorry, and consequently moving with the lorry.

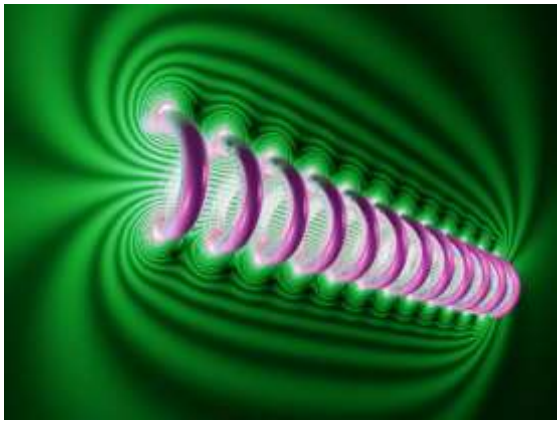
The Michelson–Morley experiment



Two quantum force units

The action of quantum forces

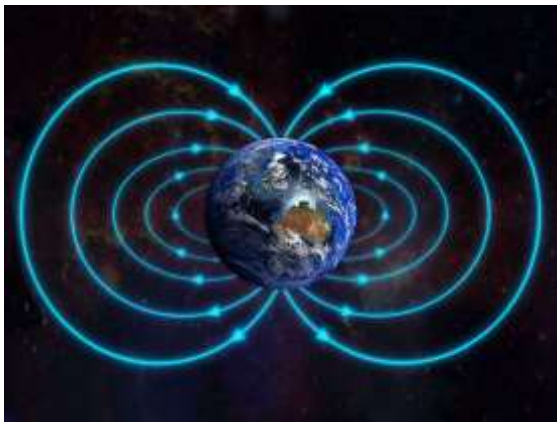
- Quantum forces have just one task, or action, and that is to repel all other quantum forces.
- It is from this one action that the universe was created, as well as every action that occurs within the universe.
- This action also forces any concentration of quantum forces to become more concentrated, and it is from this action that the four known interactions of the universe arise, including gravity and magnetism.



Magnetic field

The creation of electricity and magnetism

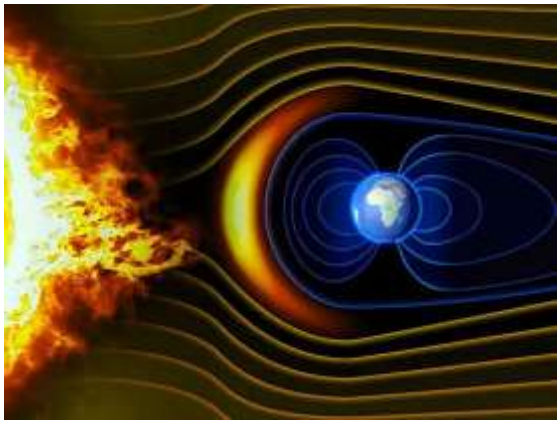
- All matter is formed from a concentration of quantum forces; however, a concentration of quantum forces can only be held stable when it is surrounded by 'attached' quantum forces.
- Whenever matter moves, so too will the surrounding cloud of quantum forces.
- For example, magnetism, which is generated by the flow of quantum forces, is itself generated by the flow of electrons (i.e. matter), which is 'electricity'.



Earth's magnetic field

Earth magnetic field

- The Earth exists as a large body of physical matter, which means it is a large body of concentrated quantum forces.
- This means the Earth is both surrounded by, and travelling with, a large cloud of attached quantum forces.
- Further to this, the movement of electrons in the Earth's iron core causes these attached quantum forces (aether) to circulate, which is what creates the Earth's magnetic field.

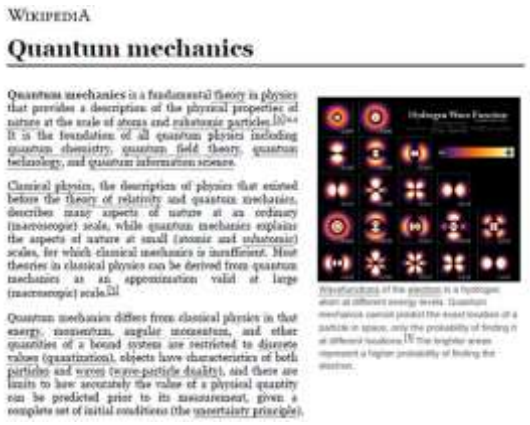


Protection from solar winds

Earth magnetic field

- Earth's magnetic field produces several important outcomes, including the deflection of solar winds.
- The Michelson–Morley experiment was conducted within this envelope of attached quantum forces; consequently, their experiment would never have been able to detect that the Earth was moving through aether because it was actually moving with its own attached cloud of aether (or quantum forces if you accept the premise of this paper).

My concerns about quantum mechanics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Quantum mechanics

Quantum mechanics is a fundamental theory in physics that provides a description of the physical properties of nature at the scale of atoms and subatomic particles.[1][2] It is the foundation of all quantum physics including quantum chemistry, quantum field theory, quantum technology, and quantum information science.

Classical physics, the description of physics that existed before the theory of relativity and quantum mechanics, describes many aspects of nature at an ordinary (macroscopic) scale, while quantum mechanics explains the aspects of nature at small (atomic and subatomic) scales, for which classical mechanics is insufficient. Most theories in classical physics can be derived from quantum mechanics as an approximation valid at large (macroscopic) scale.[3]

Quantum mechanics differs from classical physics in that energy, momentum, angular momentum, and other quantities of a bound system are restricted to discrete values (quantization), objects have characteristics of both particles and waves (wave-particle duality), and there are limits to how accurately the value of a physical quantity can be predicted prior to its measurement, given a complete set of initial conditions (the uncertainty principle).

Hydrogen Wave Function

Wavefunctions of the electron in a hydrogen atom at different energy levels. Quantum mechanics cannot predict the exact location of a particle in space, only the probability of finding it at different locations.[4] The brighter areas represent a higher probability of finding the electron.

Quantum mechanics

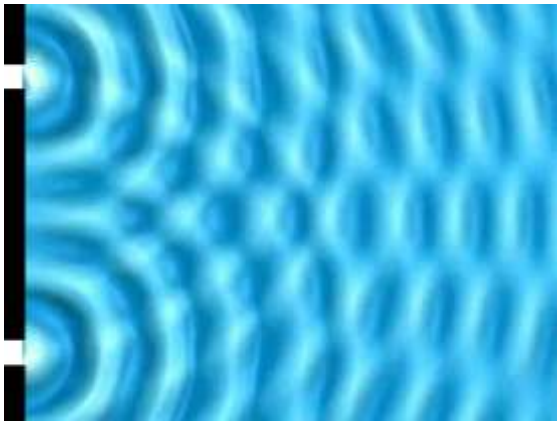
Introduction

- Quantum mechanics provides a description of the physical properties of nature at the scale of atoms and subatomic particles.
- In his time, Einstein, along with other scientists, questioned the very foundations of quantum mechanics.
- While I question many of Einstein's conclusions, I do agree with his concerns about quantum mechanics.

Mathematics

Good mathematics based on poor foundations

- If an architect designed a really good house plan, but it was built on really poor foundations, then the architectural 'design' would remain as an example of good architecture, even though the home's existence may be short-lived.
- Well, in my opinion, quantum mechanics as we known of it in 2026, represents good mathematics that is based on some questionable foundations.



Double slit experiment

The double slit experiment

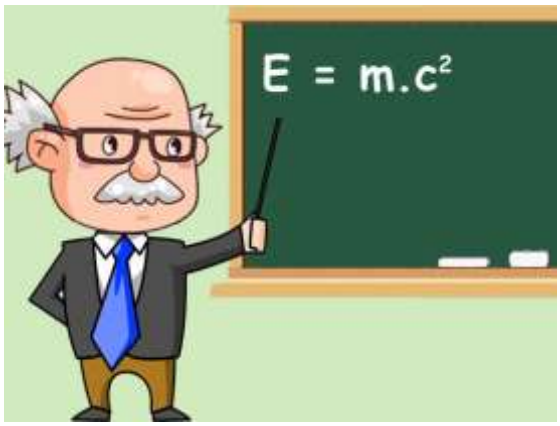
- It is believed by the founders of quantum mechanics that the double slit experiment (when performed using the projection of individual photons) demonstrates that we can never be sure of the actual position of a photon.
- However, the double slit experiment can be fully explained by fluid mechanics.
- There is no questioning as to where the photon is located—the idea that we cannot be sure of the position of a photon is false!

Explanation

Matter appearing, then disappearing

- A property of matter that has confused the sciences for a long time is the apparent appearance and disappearance of elements of matter.
- This phenomenon can reinforce the idea that we can never be sure of the actual position of a sub-atomic particle.
- But again, fluid mechanics can explain this outcome, as described over the page.

The appearance and disappearance of matter



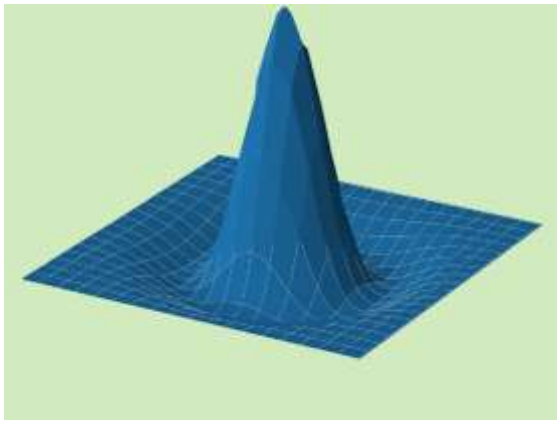
Energy equation

Introduction

- In a force-based model of the universe, 'matter' is considered to be an intense concentration of quantum forces.
- Just like any concentration of a fluid-like substance, a concentration of quantum forces can be dispersed back into a cloud of non-concentrated quantum forces.
- In fact, Einstein's energy equation:

  $E = m.c^2$

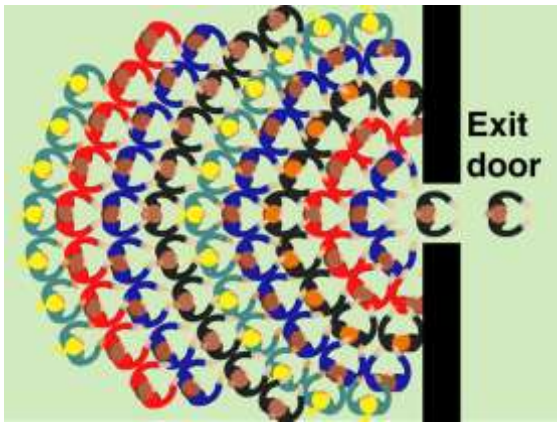
  demonstrates the amount of 'free' quantum forces that can be formed.



Photon

The formation of matter

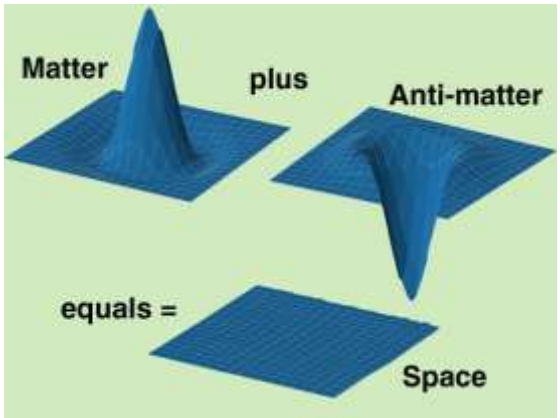
- In a uniform concentration of quantum forces, the 'region of influence' occupied by a quantum force is the same for each quantum force.
- If an increased concentration begins to occur at any location, then the surrounding quantum forces will exert an increased force of repulsion on that concentration in a manner that causes the concentration:
  - to be stable
  - to grow in concentration.



Pushing toward an exit door

The forces that form a concentration of quantum forces

- The repelling force that is exerted by a quantum force is:
  - multi-directional (3D)
  - inversely proportional to the square of the distance of separation
  - proportional to the mass of the concentration.
- The best way to imagine the force is to picture the forces exerted by a crowd of people moving towards a single exit door.

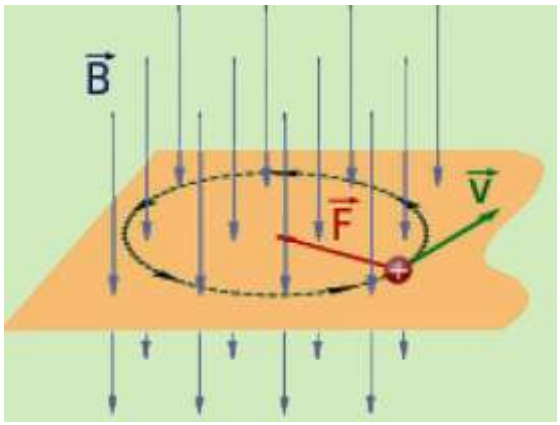


Matter plus anti-matter

The de-construction of matter

- There is a minimum concentration of quantum forces that is able to remain stable—that 'minimum' is believed to be a photon.
- If an unstable localised low-concentration of free quantum forces (i.e. anti-matter) were to approach a photon, then the photon would become unstable, and transform back into a cloud of non-concentrated 'free' quantum forces (i.e. it would disappear).

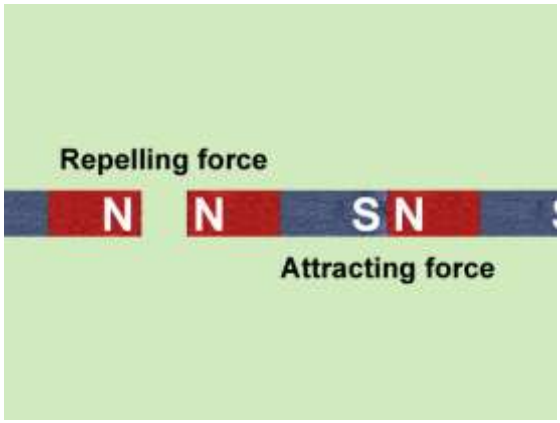
Things that are ‘wrong’ with our public explanation of magnetism



The generation of a force

The Lorentz force law

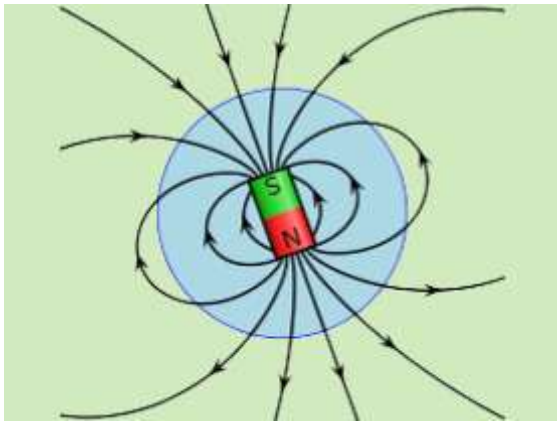
- In the 2025 explanation of a Magnetic Field, Wikipedia states in its opening paragraph:
  - *‘A moving charge in a magnetic field experiences a force perpendicular to its own velocity and to the magnetic field.’*
- But the facts are that a force is not always produced—a moving charge can pass through a magnetic field without a force being produced—it depends on the velocity of the moving charge.



Pulling force

Pulling forces

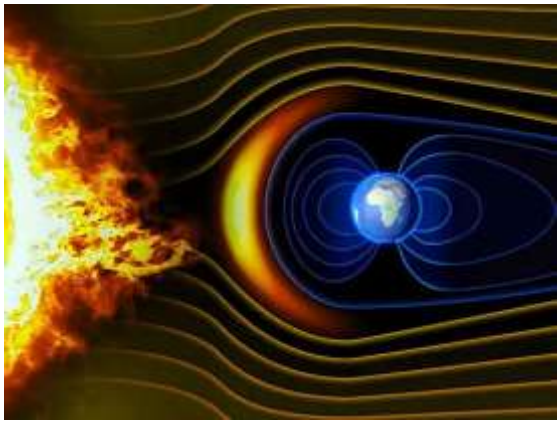
- In the 2025 explanation of a Magnetic Field, Wikipedia states in its opening paragraph:
  - *‘A permanent magnet 's magnetic field pulls on ferromagnetic materials such as iron, and attracts or repels other magnets.’*
- But the facts are that there is no such thing as a pulling or attracting force.
- A magnet does NOT pull on a piece of iron—a piece of iron is pushed.



Magnetic field

Magnetic fields

- In the 2025 explanation of a Magnetic Field, Wikipedia states:
  - *‘Magnetic fields are produced by moving electric charges and the intrinsic magnetic moments of elementary particles associated with a fundamental quantum property, their spin.’*
- I believe that a magnetic field is generated by the movement of quantum forces attached to the moving electrons, and it has nothing to do with their ‘spin’.

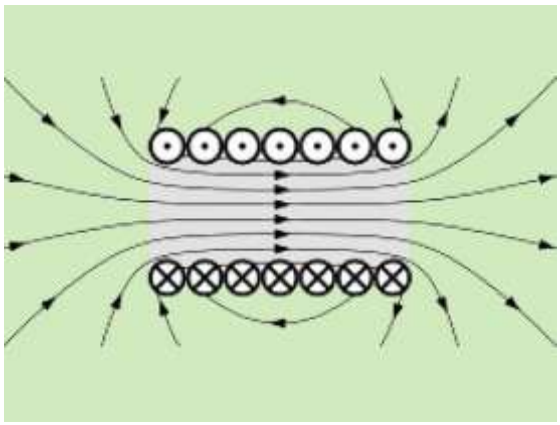


Solar winds

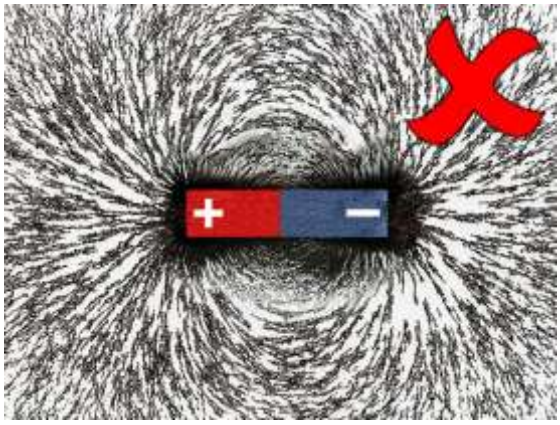
Solar winds

- Numerous publications state that solar winds consist of charged particles, which are deflected by Earth’s magnetic field.
- However, the reality is that there is no ‘charge’ to any of these particles.
- The solar winds are simply compression waves of concentrated quantum forces.
- These quantum forces are deflected by Earth’s magnetic field, which is formed from the same quantum forces.

Things that are ‘wrong’ with our public explanation of magnetism

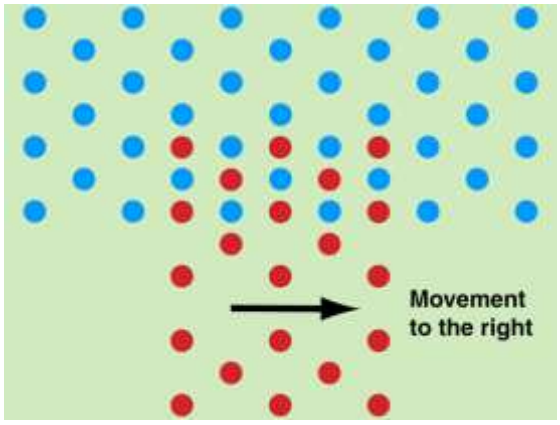


Solenoid



Arbitrarily assigned +ve and -ve ends

A smoking electric motor



Movement of a magnetic field

Statement by others

- The following statement (in various forms) has been made by several authors:
  - *‘Electric charge is the physical property of matter that causes it to experience a force when placed in an electromagnetic field.’*
- I disagree with the wording of this statement, and below I present three reasons for my disagreement.

Reason 1

- Particles are arbitrarily labelled either positive or negative based on an electron being considered negatively charged.
- Meaning that if the number of electrons exceeds the number of protons, then the particle is considered to have a negative charge.
- However, there is nothing inherent to a negatively charged particle that makes it negative—it is effectively just a count of electrons.

Reason 2

- If it were true that a charged particle will always experience a force, then such a force would continue to exist even when an electrical motor had reached its equilibrium angular velocity.
- This would mean that all electrical motors would continue to increase their angular velocity until something broke.
- Instead, this force approaches zero as the angular velocity approaches its equilibrium value; so, a force is **not always** present!

Reason 3

- The statement is misleading because the truth is that a movable magnetic field will experience a lateral force if it attempts to pass through a fixed magnetic field at an angular velocity that is less than the critical **angular** velocity.
- The ‘force’ is not acting on the electrical charge, but instead on the magnetic field attached to the electrical charge.

Thank you for your time.