PAPERS TO CHANGE THE WORLD

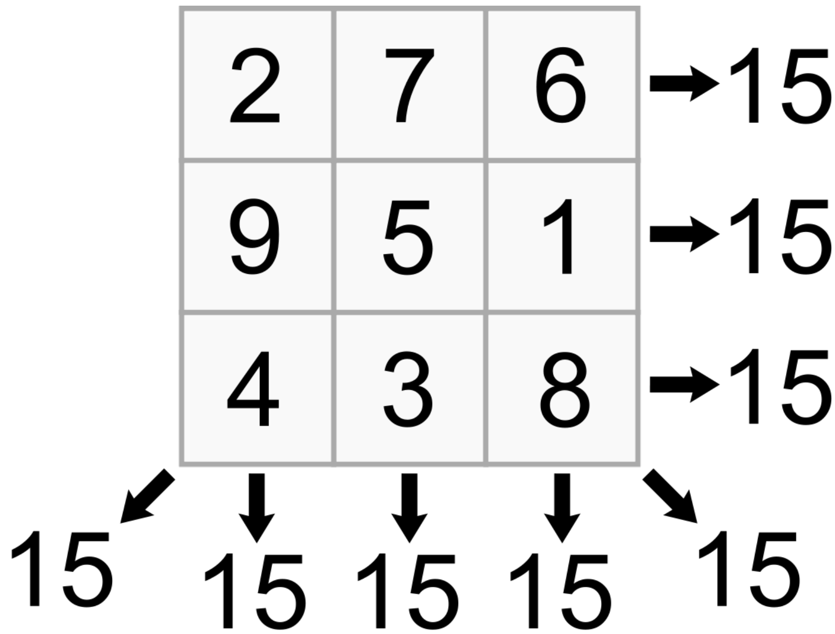
Charles Ndung'u

May 2023

Contents

1 The Complex Magic Square By Charles Ndung'u

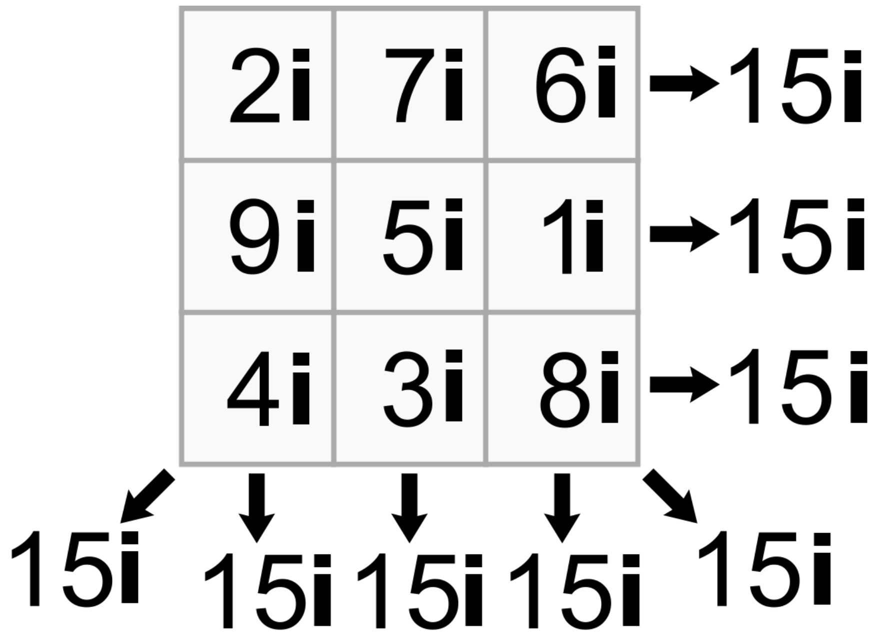
Here I wish to introduce the concept of complex analysis into the field of magic squares, suppose each magic square has an imaginary part of the square, then we can obtain the conjugate of the square.
suppose we take a magic square of the form $3 * 3$,



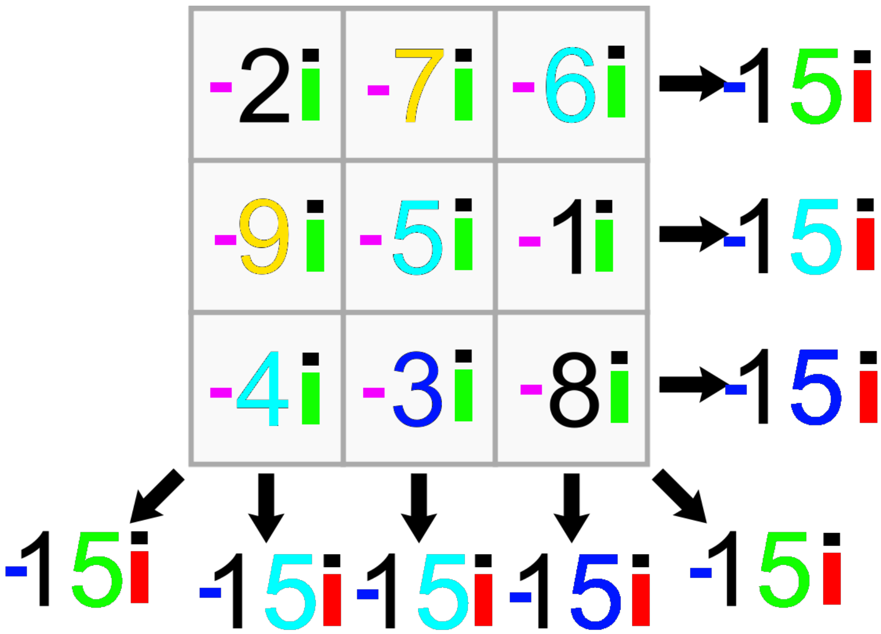
then subject this square to it's imaginary part and finally subject it further to it's conjugate.

It's worth noting that if I pick a magic square and get it's positive imaginary part multiply it by the conjugate part($-i$) of the square I will end end up with the real magic square.

Likewise a negative imaginary complex magic square will be multiplied by it's imaginary positive conjugate i



This shows that each real magic square can be broken down into two imaginary parts, that is the complex part and the conjugate complex part. To go back to the real magic square you will have to multiply it by the imaginary conjugate $-i$



When the two parts are multiplied $-ve$ complex magic square and the imaginary conjugate i, they result back to the original real magic square. Thus, with this information, we can apply the complex magic square in fields such as:

1. Patterns
2. Cryptography
3. Gaming

2 The Theory Of wireless Electricity Technology By Charles Ndung'u.

In this subject, we shall broadly look at magnetism, electric current, the Earth, and the forces within it. We shall build upon the foundations laid by Maxwell. In the end it is a goal to discover how to generate electricity by purely using the earths magnetic field, seeing how it can be transmitted as waves then seeing how it can be converted by objects such as electric cars and mobile phones.

CONSTANTS TO USE

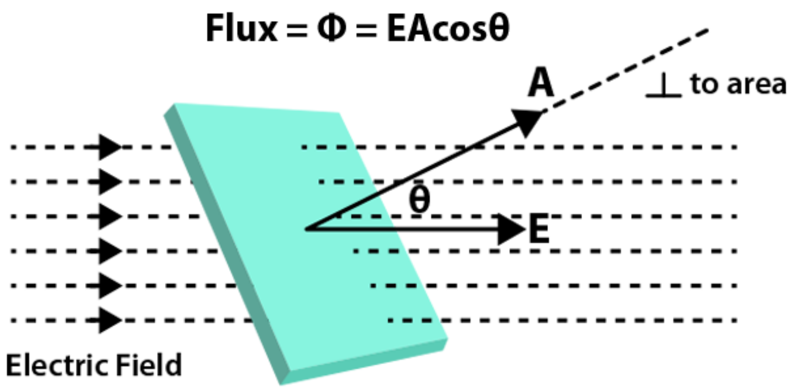
The speed of light $c = 2.9979 \times 10^8$ m/s, which encodes an upper speed limit for all physical processes.

The gravitational constant $G = 6.6741 \times 10^{-11}$ m^3 kg^{-1} s^{-2}, which encodes the strength of gravitational interactions.

The (reduced) Planck constant $\hbar = 1.05457 \times 10^{-34}$ m^2 kg s, which encodes the magnitude of quantum effects.

List of symbols to use
Mass: m
Time: t
Distance, displacement, or position: s
Velocity: v
Acceleration: a
Force: F
Energy: E
Power: P
Electric charge: Q
Electric current: I
Voltage, potential difference: V
Resistance: R
Capacitance: C
Inductance: L
Angular frequency: ω
Wavelength: λ
Frequency: f
Period: T
Planck's constant: h
Reduced Planck's constant: $\hbar$
Gravitational constant: G
Speed of light: c
Vacuum permittivity: ϵ_0
Vacuum permeability: μ_0
Vector representing force: $\vec{F}$
Electric field vector: $\vec{E}$
Magnetic field vector: $\vec{B}$
Electric current density: $\vec{J}$
Position vector: $\vec{r}$
Linear momentum: $\vec{p}$
Charles Ndung'u Nature theory: each object either living or non living possess electric charges.
We shall start by appreciating Gauss Law, $\oint \mathbf{E} \cdot d\mathbf{A} = \frac{1}{\varepsilon_0} \int \rho, dV$
According to Gauss's Law, flux refers to the flow of an electric field through a closed surface. It quantifies the amount of electric field passing through a given surface area. Mathematically, flux is calculated by taking the dot product of the electric field vector (E) and an infinitesimal area vector (dA) at each point on the surface and summing up these contributions over the entire surface.

simply put Flux is a measure of the field's strength and how much it "penetrates" the surface.



The expression for flux is written as:
The electric flux (Φ) according to Gauss's Law is given by:

$$\Phi = \oint \mathbf{E} \cdot d\mathbf{A}$$

Φ represents the electric flux.
$\oint$ denotes the surface integral, indicating that we are summing up the contributions over a closed surface.
$\mathbf{E}$ is the electric field vector.
$d\mathbf{A}$ is an infinitesimal area vector on the surface.
Electric charge produces an electric field, and the flux of that field passing through any closed surface is proportional to the total charge contained within that surface.

DOT PRODUCT

Let's consider two vectors, $\mathbf{A} = (2, 3, 4)$ and $\mathbf{B} = (5, -1, 2)$.

The dot product of $\mathbf{A}$ and $\mathbf{B}$, denoted as $\mathbf{A} \cdot \mathbf{B}$, is calculated by multiplying the corresponding components of the two vectors and summing them up:

$$\mathbf{A} \cdot \mathbf{B} = (2 \times 5) + (3 \times -1) + (4 \times 2) = 10 - 3 + 8 = 15.$$

So, the dot product of $\mathbf{A}$ and $\mathbf{B}$ is 15.

CROSS PRODUCT

Using the same vectors **A** and **B** as above, we can calculate their cross product, denoted as $\mathbf{A} \times \mathbf{B}$:

$$\mathbf{A}\times\mathbf{B} = ((3\times2)-(-1\times4), (-1\times5)-(2\times2), (2\times3)-(5\times4)) = (6-(-4), -5-4, 6-20) = (10, -9, -14).$$

So, the cross product of **A** and **B** is the vector $(10, -9, -14)$.

explanation.
When an electric field is present, it extends throughout space, and its strength and direction vary at different points. The flux of the electric field passing through any closed surface refers to the total number of electric field lines that intersect or "pierce" that surface.

According to Gauss's Law, the flux of the electric field passing through a closed surface is proportional to the total charge contained within that surface. Mathematically, it can be expressed as:
$\Phi = \frac{Q}{\varepsilon_0}$
In this equation: Φ represents the electric flux.

Q denotes the total charge enclosed within the closed surface.

ε_0 is the permittivity of free space, which is a constant.

This proportionality relationship means that as the total charge within a closed surface increases, the electric flux passing through that surface also increases. It implies that the electric field lines originating from positive charges and terminating on negative charges contribute to the overall flux.

Thus, the statement highlights the fundamental connection between electric charge, electric fields, and the flux of those fields. The amount of electric field passing through a closed surface is directly related to the total charge contained within that surface, as described by Gauss's Law.

Example Flux Calculation

Let's consider a closed surface in the shape of a sphere of radius R centered at the origin. We have an electric field given by $\mathbf{E} = (3x, 2y, z)$.

To calculate the flux of this electric field through the surface of the sphere, we need to integrate the dot product of the electric field and the outward-pointing surface normal vector over the surface.

The surface integral for flux can be expressed as:

The flux can be represented as the surface integral:

$$\Phi =_S \mathbf{E} \cdot \mathbf{n} \, dA$$

where S is the surface, $\mathbf{E}$ is the electric field, $\mathbf{n}$ is the outward-pointing surface normal vector, and dA is an infinitesimal element of area on the surface.

For a sphere, the outward-pointing surface normal vector $\mathbf{n}$ is simply the position vector divided by its magnitude, $\mathbf{n} = \frac{\mathbf{r}}{|\mathbf{r}|}$, where $\mathbf{r}$ is the position vector.

To evaluate the integral, we can use spherical coordinates. The element of area dA can be expressed as $R^2 \sin\theta, d\theta, d\phi$, where θ is the polar angle and ϕ is the azimuthal angle.

So, the flux integral can be written as:

The flux can be calculated using the surface integral:

$$\Phi = \int_0^{2\pi} \int_0^{\pi} \mathbf{E} \cdot \left(\frac{|\mathbf{r}|}{\mathbf{r}} \right) R^2 \sin\theta \, d\theta \, d\phi$$

where $\mathbf{E}$ is the electric field, $\mathbf{r}$ is the position vector, R is the radius, θ is the polar angle, and ϕ is the azimuthal angle.

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where $\mathbf{E}$ is the electric field, $\mathbf{r}$ is the position vector, R is the radius, θ is the polar angle, and ϕ is the azimuthal angle.

Now, we substitute the components of the electric field $\mathbf{E} = (3x, 2y, z)$ and the position vector $\mathbf{r} = (R\sin\theta\cos\phi, R\sin\theta\sin\phi, R\cos\theta)$ into the integral expression.

After evaluating the integral over the entire surface, you will obtain the flux of the electric field through the given sphere.

Please note that this is a general example, and the specific details of the surface and electric field may vary depending on the problem at hand. The approach of using the dot product with the surface normal vector and integrating over the surface is a common method for calculating flux in various contexts, such as electrostatics and electromagnetic theory.

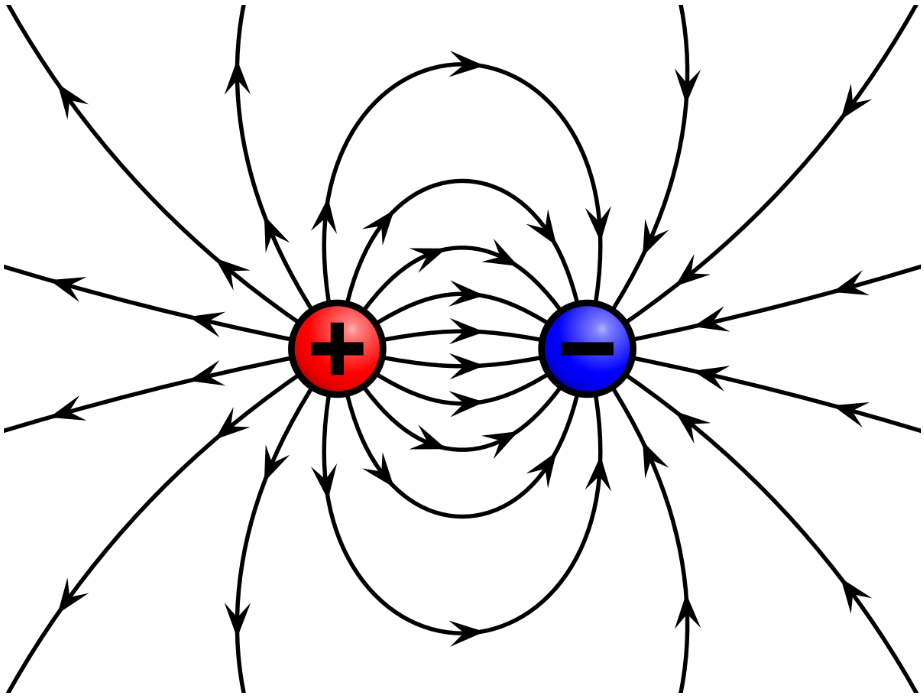
Question: Does the earth we live in contain erectric charges? If yes what is the flux of the earth.

Yes, the Earth does contain electric charges. The Earth as a whole is electrically neutral, meaning the total positive charge is balanced by the total negative charge. However, there are various sources of electric charges on Earth.

One significant source of electric charges on Earth is the presence of ions in the atmosphere. These ions are created through various processes such as cosmic radiation, lightning discharges, and chemical reactions. The ions can be positive (cations) or negative (anions) and contribute to the overall electrical balance of the Earth.
Another source of electric charges on Earth is the presence of static electricity. Objects on Earth can become electrically charged through processes such as friction or separation of charges. For example, rubbing two objects together can transfer electrons, resulting in one object becoming negatively charged and the other positively charged.
It's important to note that the electric charges on Earth are relatively small and do not have a significant impact on daily life. However, they can play a role in atmospheric phenomena, such as the formation of lightning and the behavior of electric fields in the atmosphere.

So how does friction generate electric charges from a body?

Friction can generate electric charges through a process known as triboelectric charging. When two objects come into contact and then separate, the friction between them can cause an exchange of electrons, resulting in one object gaining electrons (becoming negatively charged) and the other losing electrons (becoming positively charged). This transfer of electrons occurs due to differences in the materials' electron affinity, or their tendency to either attract or release electrons.



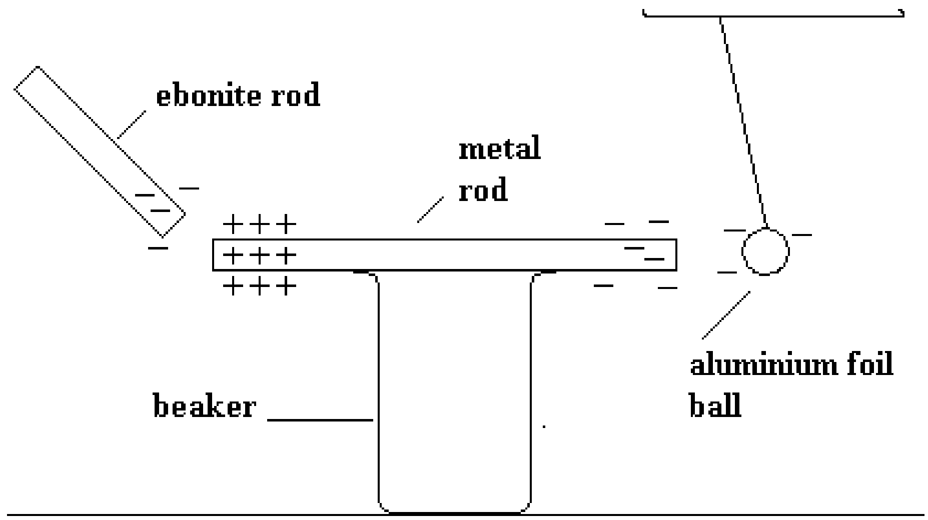
Here's a step-by-step explanation of how friction generates electric charges:

Contact: Two objects with different electron affinities come into contact with each other.

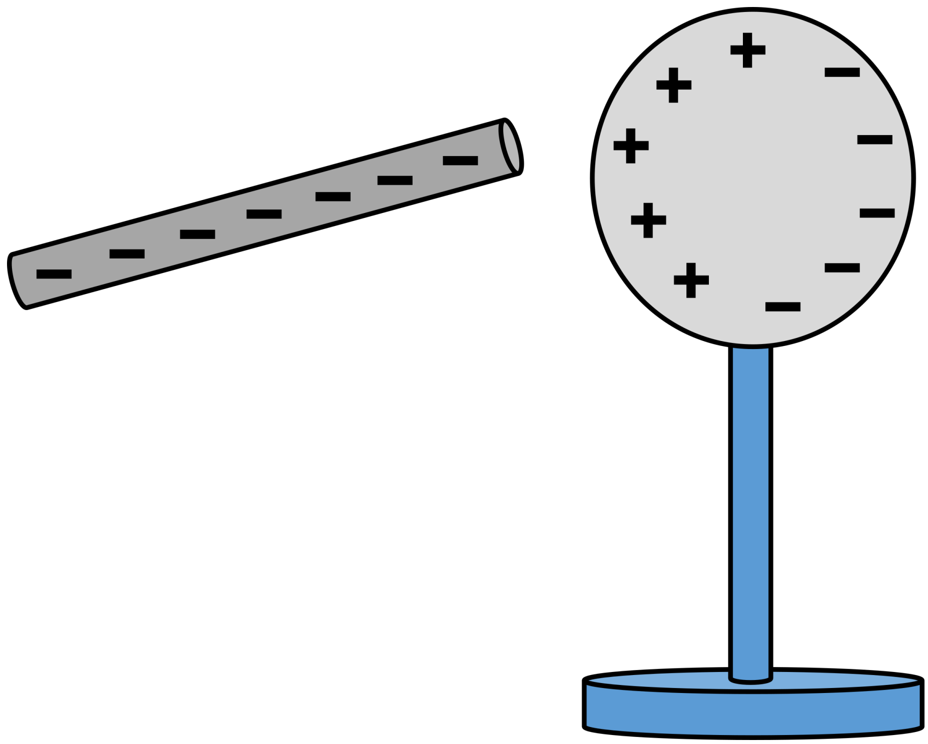
Electron Transfer: As the objects are rubbed or moved relative to each other, the friction between them causes the outer electrons of one material to be transferred to the other. The material with a higher electron affinity tends to attract electrons, while the one with a lower electron affinity tends to release electrons.

Charge Separation: The transferred electrons accumulate on one object, giving it a negative charge (excess electrons), while the other object loses electrons and acquires a positive charge (electron deficiency).

The specific charges acquired by the objects depend on their electron affinities and other material properties. The triboelectric series is a list that ranks various materials based on their tendencies to gain or lose electrons when in contact with other materials. By consulting this series, you can determine which material is likely to become positively charged and which will become negatively charged when rubbed together.

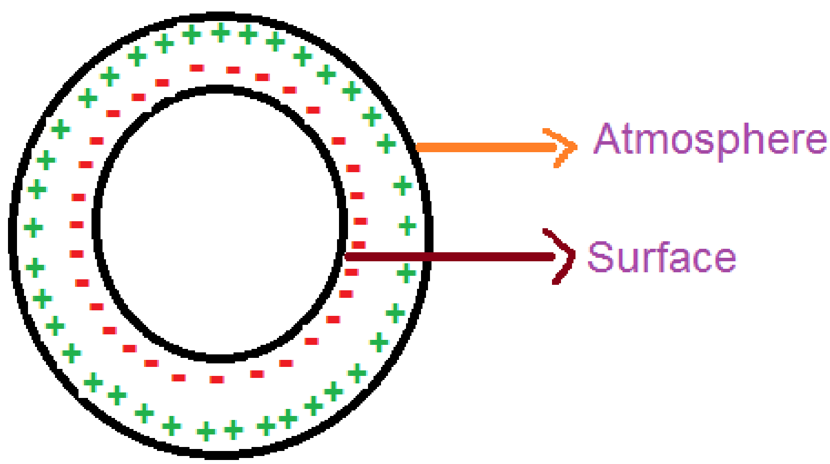


It's important to note that triboelectric charging can occur with different materials, such as plastic and fabric, rubber and glass, or even hair and a comb. The resulting charges can be temporary or may persist for some time, depending on factors like humidity and the materials involved.



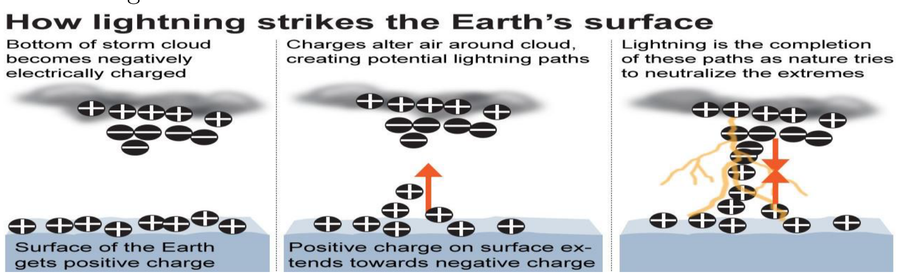
Friction-induced charging is a common phenomenon and is utilized in various applications, including electrostatic generators, photocopying machines, and certain types of sensors.

what charge is the core of the earth?

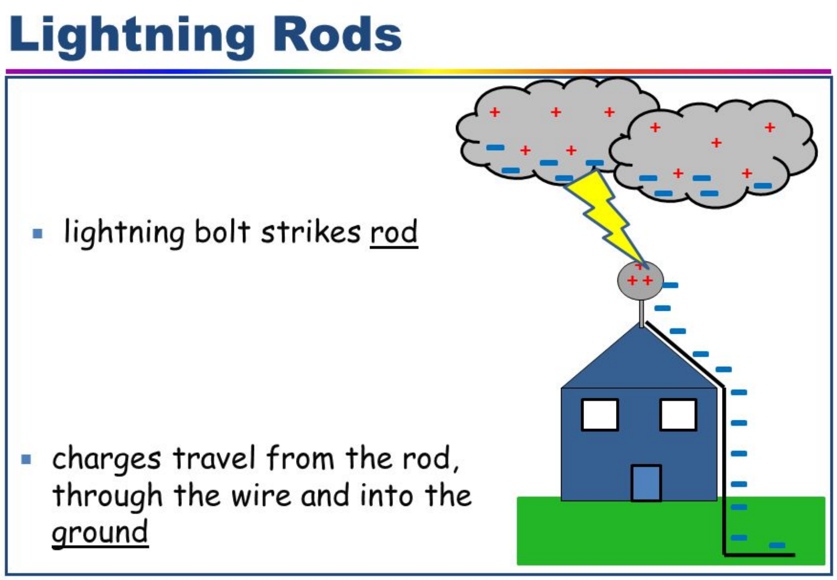


The core of the Earth is primarily composed of iron and nickel, and it is believed to be electrically conductive. However, the overall charge of the Earth's core is not well-defined or precisely known.

The Earth as a whole is electrically neutral, meaning that the total positive charge is balanced by the total negative charge. This electrical neutrality extends to the core as well. While there may be localized variations in charge distribution within the Earth's core due to various geological processes, the overall charge of the core is considered neutral.



It's important to note that the Earth's core is primarily characterized by its high temperature and pressure conditions, as well as its solid inner core and molten outer core.



The electrical conductivity of the core plays a significant role in generating Earth's magnetic field through a process called the dynamo effect.

The flux of the Earth

The flux of the Earth, in the context of Gauss's Law, refers to the total electric field passing through a closed surface surrounding the Earth. However, the Earth as a whole does not have a net electric charge, so the electric flux through a closed surface enclosing the Earth is typically zero.

Gauss's Law states that the total electric flux passing through a closed surface is proportional to the total charge enclosed within that surface. Since the Earth is electrically neutral, the total charge enclosed within a closed surface encompassing the entire Earth is zero. Therefore, the electric flux through such a surface is also zero.

It's important to note that the Earth does have a magnetic field, which is produced by electric currents in its core. The magnetic flux, which measures the strength of the magnetic field passing through a given surface, is non-zero and plays a significant role in various geophysical processes and interactions with the Sun's magnetic field.

Does a hot object contain magnetic fields

A hot object can generate a magnetic field under certain conditions. When an object is heated, the motion of charged particles within it, such as electrons or ions, can change. This motion of charged particles creates electric currents, and electric currents are associated with the generation of magnetic fields.

There are two main scenarios where a hot object can have a magnetic field:

Electric Currents: If a hot object contains electric currents, either due to the movement of charged particles or induced currents, it can generate a magnetic field. This is known as thermal magnetic field generation. The magnitude and distribution of the magnetic field depend on the specific geometry, temperature, and material properties of the object.

Thermoelectric Effects: In certain materials, temperature gradients can give rise to thermoelectric effects. These effects occur when there is a temperature difference across a material, leading to the generation of a voltage or electric current. If the material has an inherent magnetic property, such as ferromagnetic or paramagnetic behavior, the temperature gradient can induce or influence a magnetic field in the material.

It's important to note that the magnetic field generated by a hot object is typically weak and localized to the region surrounding the object. The strength and characteristics of the magnetic field depend on various factors, including the temperature, composition, and structure of the object.

In summary, a hot object can generate a magnetic field through the presence of electric currents or thermoelectric effects, but the magnitude and extent of the magnetic field will vary depending on the specific circumstances and properties of the object.

Example

Consider a body with temperature distribution $u(x,t)$, where x represents spatial coordinates and t represents time. The heat equation governing the temperature evolution in the body is given by:

$$\frac{\partial u}{\partial t} = k\frac{\partial^2 u}{\partial x^2}$$

where k is the thermal diffusivity constant.

To calculate the heat at any surface, let's consider a surface located at $x = a$. We can apply Laplace transforms to the heat equation with respect to the time variable t. Taking the Laplace transform of both sides of the heat equation, we have:

$$sU(x,s) - u(x,0) = k\frac{d^2 U}{dx^2}$$

where $U(x,s)$ represents the Laplace transform of $u(x,t)$ and $u(x,0)$ represents the initial temperature distribution.

Laplace transform review

To derive the equation $sU(x,s) - u(x,0) = k\frac{d^2U}{dx^2}$, we start by considering the Laplace transform of the heat equation:

$$\frac{\partial u}{\partial t} = k\frac{\partial^2 u}{\partial x^2}$$

Taking the Laplace transform of both sides of the equation with respect to the time variable t, we get:

$$\mathcal{L}\left[\frac{\partial u}{\partial t}\right] = \mathcal{L}\left[k\frac{\partial^2 u}{\partial x^2}\right]$$

Using the linearity property of the Laplace transform and the derivative property, we have:

$$s\mathcal{L}[u] - u(x,0) = k\frac{d^2}{dx^2}\left(\mathcal{L}[u]\right)$$

Denoting the Laplace transform of $u(x,t)$ as $U(x,s)$, we substitute $\mathcal{L}[u] =$

$U(x, s)$ into the equation:

$$sU(x,s) - u(x,0) = k\frac{d^2U}{dx^2}$$

which is the desired equation.

The linearity property of the Laplace transform states that for any constants a and b and functions $f(t)$ and $g(t)$, the Laplace transform of the linear combination $af(t) + bg(t)$ is equal to the linear combination of their individual Laplace transforms:

$$\mathcal{L}[af(t) + bg(t)] = a\mathcal{L}[f(t)] + b\mathcal{L}[g(t)]$$

This property allows us to split the Laplace transform of a sum or difference of functions into individual Laplace transforms, making it easier to compute the transform.

Derivative Property:

The derivative property of the Laplace transform relates the Laplace transform of the derivative of a function $f(t)$ to the Laplace transform of the original function.

If $\mathcal{L}[f(t)] = F(s)$, where $F(s)$ is the Laplace transform of $f(t)$, then the Laplace transform of the derivative $\frac{df}{dt}$ is given by:

$$\mathcal{L}\left[\frac{df}{dt}\right] = sF(s) - f(0)$$

where $f(0)$ represents the initial value of the function $f(t)$.

This property allows us to find the Laplace transform of a derivative by performing algebraic operations on the Laplace transform of the original function.

These properties, the linearity property and the derivative property, are fundamental in simplifying the computation of Laplace transforms and handling differential equations using the Laplace transform method.

Derivative Property for Fourth Derivative:

The derivative property of the Laplace transform extends to higher-order derivatives as well. Let's consider the derivative property for the fourth derivative of a function $f(t)$.

If the Laplace transform of $f(t)$ is denoted as $\mathcal{L}[f(t)] = F(s)$, then the Laplace transform of the fourth derivative $\frac{d^4f}{dt^4}$ can be expressed as:

$$\mathcal{L}\left[\frac{d^4f}{dt^4}\right] = s^4F(s) - s^3f(0) - s^2f'(0) - sf''(0) - f'''(0)$$

Here, $f(0)$, $f'(0)$, $f''(0)$, and $f'''(0)$ represent the initial values of $f(t)$, its first derivative, second derivative, and third derivative, respectively.

This property allows us to find the Laplace transform of higher-order derivatives by applying algebraic operations involving powers of s to the Laplace transform of the original function.

By utilizing the derivative property of the Laplace transform for higher-order derivatives, we can conveniently solve differential equations involving multiple derivatives by transforming them into algebraic equations in the Laplace domain.

Now, we can solve the resulting ordinary differential equation for $U(x, s)$ using appropriate boundary conditions. Once we obtain the Laplace transform of the temperature distribution, we can apply the inverse Laplace transform to obtain the temperature profile $u(x, t)$.

Finally, to calculate the heat at the surface $x = a$ at any given time t, we substitute $x = a$ into the inverse Laplace transform expression of $u(x, t)$ and evaluate it accordingly.

Thus we need to know the surface area and the electric field to get flux

Yes, that's correct. To calculate the electric flux passing through a surface, you need to know the surface area and the electric field.

The electric flux (Φ) passing through a closed surface is given by the equation:

$$\Phi = \int \mathbf{E} \cdot \mathbf{dA},$$

where:

- $\mathbf{E}$ is the electric field vector,
- $\mathbf{dA}$ is an infinitesimal area vector on the surface.

To calculate the flux, you need to integrate the dot product of the electric field E and the infinitesimal area vector dA over the entire surface. This integration accounts for the varying orientation and magnitude of the electric field and the surface area.

So, to determine the electric flux, you need to have knowledge of the electric field distribution throughout the surface and the surface's geometry or area. Only then can you perform the necessary integration to calculate the flux accurately.

To get electric field do we ned to know the charges in the body

Yes, to calculate the electric field, it is necessary to know the charges present in the body or the distribution of charges within the body. The electric field at a point in space is influenced by the charges and their distribution in the vicinity.

According to Coulomb's law, the electric field E at a point in space is determined by the charges present in the surroundings. The electric field due to a point charge can be calculated using the formula:

$E = \frac{k \cdot q}{r^2} \cdot \mathbf{\hat{r}}$

where: k is the electrostatic constant (Coulomb's constant),

q is the charge of the source,

r is the distance between the source charge and the point in space where the electric field is being calculated,

$\mathbf{\hat{r}}$ is the unit vector pointing from the source charge to the point in space.
For more complex charge distributions, the electric field is calculated by superposition. This means that the electric field at a point is determined by summing up the contributions from each individual charge in the distribution.

Therefore, to accurately determine the electric field, you need to know the charges present in the body and their distribution. The charges influence the electric field, and the field's strength and direction vary depending on the charges' magnitudes, positions, and distributions.

3 The Theory Of Constructing A Floating City That Opposes Gravity By Charles Ndung'u.

We shall begin by asking ourselves does energy contain frequency?

Does mass contain frequencies? What would happen if we altered the frequencies of any object?

Frequency is a fundamental concept in physics and engineering, referring to the number of occurrences or cycles of a repeating event or phenomenon that happen within a given unit of time. It is typically measured in hertz (Hz), which represents the number of cycles per second.

$$f = \frac{1}{T}$$

where f represents the frequency and T represents the period.

According to Charles Ndung'u we all are united by charges which in turn have frequencies thus there are also electric charges present.

according to Charles Ndung'u the world is made of three things:

frequencies, charges and motion.

for the earth to work there has to be these three things in place. The motion frequencies and charges all exist together and are inseparable.

To make something oppose it's original state we must alter the three things frequency, motion and charges.

What is the frequencies required to form something?

Making something requires some form of frequencies, motion and charges. Thus how do we make something independent of the influence of the earth?