Acoustics

Acoustics is a branch of physics that deals with the study of mechanical waves in gases, liquids, and solids including topics such as vibration, sound, ultrasound and infrasound.

Google

Question:

What is acoustics?

Question:

Write ground state configuration for atom number T in Periodic Table.

1s^1 for hydrogen

The **Planck constant**, or **Planck's constant**, denoted by ℎh, is a fundamental [physical constant](https://en.wikipedia.org/wiki/Physical_constant) of foundational importance in [quantum mechanics](https://en.wikipedia.org/wiki/Quantum_mechanics): a [photon](https://en.wikipedia.org/wiki/Photon)'s energy is equal to its [frequency](https://en.wikipedia.org/wiki/Frequency) multiplied by the Planck constant, and the [wavelength](https://en.wikipedia.org/wiki/Wavelength) of a [matter wave](https://en.wikipedia.org/wiki/Matter_wave) equals the Planck constant divided by the associated particle momentum. The constant was first postulated by [Max Planck](https://en.wikipedia.org/wiki/Max_Planck) in 1900 as a [proportionality constant](https://en.wikipedia.org/wiki/Proportionality_constant) needed to explain experimental [black-body](https://en.wikipedia.org/wiki/Black-body) radiation. Planck later referred to the constant as the "quantum of [action](https://en.wikipedia.org/wiki/Action_%28physics%29)". In 1905, [Albert Einstein](https://en.wikipedia.org/wiki/Albert_Einstein) associated the "quantum" or minimal element of the energy to the electromagnetic wave itself. Max Planck received the 1918 [Nobel Prize in Physics](https://en.wikipedia.org/wiki/Nobel_Prize_in_Physics) "in recognition of the services he rendered to the advancement of Physics by his discovery of energy quanta".

In [metrology](https://en.wikipedia.org/wiki/Metrology), the Planck constant is used, together with other constants, to define the [kilogram](https://en.wikipedia.org/wiki/Kilogram), the [SI unit](https://en.wikipedia.org/wiki/SI_unit) of mass.

en.wikipedia.org/wiki/Planck\_constant

Question:

Explain Planck constant.

Question:

What is electron-volt?

Question:

Find energy change of electron for hydrogen, n1 = T, n2 = s.

$$E= hf= 13.6Z^{2}\left(\frac{1}{n\_{2}^{2}}-\frac{1}{n\_{1}^{2}}\right)$$

s = 22123456

T = s Mod 100

n1 = T

n2 = s

Z = 1

E = 13.6 \* Z \* Z \* (1 / (n2 \* n2) - 1 / (n1 \* n1))

MsgBox E

MsgBox "Energy is measured in electron-volts."

MsgBox "1 significant figure"

Question:

Explain main nuclear reactions.

Question:

How safe is nuclear technology?

Question:

How many dimensions are there in the Universe?

10

Question:

Watch physics lectures series

youtube.com/watch?v=KOKnWaLiL8w&list=PLFE3074A4CB751B2B

Standard Model

The **Standard Model** of [particle physics](https://en.wikipedia.org/wiki/Particle_physics) is the [theory](https://en.wikipedia.org/wiki/Theory) describing three of the four known [fundamental forces](https://en.wikipedia.org/wiki/Fundamental_force) ([electromagnetic](https://en.wikipedia.org/wiki/Electromagnetism), [weak](https://en.wikipedia.org/wiki/Weak_interaction) and [strong interactions](https://en.wikipedia.org/wiki/Strong_interaction) – excluding [gravity](https://en.wikipedia.org/wiki/Gravity)) in the [universe](https://en.wikipedia.org/wiki/Universe) and classifying all known [elementary particles](https://en.wikipedia.org/wiki/Elementary_particle). It was developed in stages throughout the latter half of the 20th century, through the work of many scientists worldwide

en.wikipedia.org/wiki/Standard\_Model

Question:

What is Standard Model?

Dark matter

In [astronomy](https://en.wikipedia.org/wiki/Astronomy), **dark matter** is a hypothetical form of [matter](https://en.wikipedia.org/wiki/Matter) that appears to not interact with [light](https://en.wikipedia.org/wiki/Light) or the [electromagnetic field](https://en.wikipedia.org/wiki/Electromagnetic_field). Dark matter is implied by [gravitational](https://en.wikipedia.org/wiki/Gravity) effects which cannot be explained by [general relativity](https://en.wikipedia.org/wiki/General_relativity) unless more matter is present than can be seen, which include: [formation and evolution of galaxies](https://en.wikipedia.org/wiki/Galaxy_formation_and_evolution)

en.wikipedia.org/wiki/Dark\_matter

Question:

What is dark matter?

Dark energy

In [physical cosmology](https://en.wikipedia.org/wiki/Physical_cosmology) and [astronomy](https://en.wikipedia.org/wiki/Astronomy), **dark energy** is an unknown form of [energy](https://en.wikipedia.org/wiki/Energy) that affects the [universe](https://en.wikipedia.org/wiki/Universe) on the largest scales. Its primary effect is to drive the [accelerating expansion of the universe](https://en.wikipedia.org/wiki/Accelerating_expansion_of_the_universe). Assuming that the [lambda-CDM model](https://en.wikipedia.org/wiki/Lambda-CDM_model) of cosmology is correct

en.wikipedia.org/wiki/Dark\_energy

Question:

What is dark energy?

Blackhole as quantum computer

youtube.com/watch?v=861coSFLOvk

Question:

What is blackhole as quantum computer?

Wormhole

A wormhole is like a tunnel between two distant points in our universe that cuts the travel time from one point to the other. Instead of traveling for many millions of years from one galaxy to another, under the right conditions one could theoretically use a wormhole to cut the travel time down to hours or minutes.

Google

Question:

Explain wormhole.

Scattering

Scattering, in physics, a change in the direction of motion of a particle because of a collision with another particle. As defined in physics, a collision can occur between particles that repel one another, such as two positive (or negative) ions, and need not involve direct physical contact of the particles.

Google

Question:

What is scattering?

Spectroscopy

Spectroscopy is the study of the absorption and emission of light and other radiation by matter. It involves the splitting of light (or more precisely electromagnetic radiation) into its constituent wavelengths (a spectrum), which is done in much the same way as a prism splits light into a rainbow of colours.

Google

Question:

Explain spectroscopy.

A **physical constant**, sometimes **fundamental physical constant** or **universal constant**, is a [physical quantity](https://en.wikipedia.org/wiki/Physical_quantity) that is generally believed to be both universal in nature and have [constant](https://en.wikipedia.org/wiki/Constant_%28mathematics%29) value in time. It is distinct from a [mathematical constant](https://en.wikipedia.org/wiki/Mathematical_constant), which has a fixed numerical value, but does not directly involve any physical measurement.

en.wikipedia.org/wiki/Physical\_constant

The term [physical constant](https://en.wikipedia.org/wiki/Physical_constant) expresses the notion of a [physical quantity](https://en.wikipedia.org/wiki/Physical_quantity) subject to experimental measurement which is independent of the time or location of the experiment. The constancy (immutability) of any "physical constant" is thus subject to experimental verification.

[Paul Dirac](https://en.wikipedia.org/wiki/Paul_Dirac) in 1937 [speculated](https://en.wikipedia.org/wiki/Dirac_large_numbers_hypothesis) that physical constants such as the [gravitational constant](https://en.wikipedia.org/wiki/Gravitational_constant) or the [fine-structure constant](https://en.wikipedia.org/wiki/Fine-structure_constant) might be subject to change over time in proportion of the [age of the universe](https://en.wikipedia.org/wiki/Age_of_the_universe).

en.wikipedia.org/wiki/Time-variation\_of\_fundamental\_constants

Question:

Explain physical constants.

Question:

Explain variation of physical constants.

The **Hall effect** is the production of a [potential difference](https://en.wikipedia.org/wiki/Voltage) (the **Hall voltage**) across an [electrical conductor](https://en.wikipedia.org/wiki/Electrical_conductor) that is [transverse](https://en.wiktionary.org/wiki/transverse) to an [electric current](https://en.wikipedia.org/wiki/Electric_current) in the conductor and to an applied [magnetic field](https://en.wikipedia.org/wiki/Magnetic_field) perpendicular to the current. It was discovered by [Edwin Hall](https://en.wikipedia.org/wiki/Edwin_Hall) in 1879.

en.wikipedia.org/wiki/Hall\_effect

Question:

What is Hall effect?

Particles

Lepton

In [particle physics](https://en.wikipedia.org/wiki/Particle_physics), a **lepton** is an [elementary particle](https://en.wikipedia.org/wiki/Elementary_particle) of [half-integer spin](https://en.wikipedia.org/wiki/Half-integer_spin)

en.wikipedia.org/wiki/Lepton

Question:

What is lepton?

Neutrino

The neutrino is perhaps the best-named particle in the Standard Model of Particle Physics: it is tiny, neutral, and weighs so little that no one has been able to measure its mass. Neutrinos are the most abundant particles that have mass in the universe.

Google

Question:

What is neutrino?

Higgs boson

The **Higgs boson**, sometimes called the **Higgs particle**, is an [elementary particle](https://en.wikipedia.org/wiki/Elementary_particle) in the [Standard Model](https://en.wikipedia.org/wiki/Standard_Model) of [particle physics](https://en.wikipedia.org/wiki/Particle_physics) produced by the [quantum excitation](https://en.wikipedia.org/wiki/Excited_state) of the **Higgs field**, one of the [fields](https://en.wikipedia.org/wiki/Field_%28physics%29) in [particle physics](https://en.wikipedia.org/wiki/Particle_physics) theory.

en.wikipedia.org/wiki/Higgs\_boson

Question:

What is Higgs boson?

Vacuum

A **vacuum** is a [space](https://en.wikipedia.org/wiki/Space) devoid of [matter](https://en.wikipedia.org/wiki/Matter).

en.wikipedia.org/wiki/Vacuum

Question:

What is vacuum?

Energy of vacuum

The effects of vacuum energy can be experimentally observed in various phenomena such as [spontaneous emission](https://en.wikipedia.org/wiki/Spontaneous_emission), the [Casimir effect](https://en.wikipedia.org/wiki/Casimir_effect) and the [Lamb shift](https://en.wikipedia.org/wiki/Lamb_shift), and are thought to influence the behavior of the Universe on [cosmological scales](https://en.wikipedia.org/wiki/Physical_cosmology). Using the upper limit of the [cosmological constant](https://en.wikipedia.org/wiki/Cosmological_constant), the vacuum energy of free space has been estimated to be…..

However, in [quantum electrodynamics](https://en.wikipedia.org/wiki/Quantum_electrodynamics), consistency with the principle of [Lorentz covariance](https://en.wikipedia.org/wiki/Lorentz_covariance) and with the magnitude of the [Planck constant](https://en.wikipedia.org/wiki/Planck_constant) suggests a much larger value …..

This huge discrepancy is known as the [cosmological constant problem](https://en.wikipedia.org/wiki/Cosmological_constant_problem) or, colloquially, the "vacuum catastrophe."

en.wikipedia.org/wiki/Vacuum\_energy

Question:

What is energy of vacuum?

Antimatter

Antimatter, substance composed of subatomic particles that have the mass, electric charge, and magnetic moment of the electrons, protons, and neutrons of ordinary matter but for which the electric charge and magnetic moment are opposite in sign.

Google

Question:

What is antimatter?

Parallel Universe

A parallel universe, also known as an alternate universe, parallel world, parallel dimension, or alternate reality, is a hypothetical self-contained plane of existence, co-existing with one's own. The sum of all potential parallel universes that constitute reality is often called a "multiverse".

Google

Question:

What is parallel universe.

Theory of everything

A theory of everything (TOE), final theory, ultimate theory, unified field theory or master theory is a hypothetical, singular, all-encompassing, coherent theoretical framework of physics that fully explains and links together all aspects of the universe.

Google

Question:

What is theory of everything?

Exceptionally simple theory of everything

en.wikipedia.org/wiki/An\_Exceptionally\_Simple\_Theory\_of\_Everything

Question:

What is Exceptionally simple theory of everything?

Quantum field theory

In [theoretical physics](https://en.wikipedia.org/wiki/Theoretical_physics), **quantum field theory** (**QFT**) is a theoretical framework that combines [classical field theory](https://en.wikipedia.org/wiki/Classical_field_theory), [special relativity](https://en.wikipedia.org/wiki/Special_relativity), and [quantum mechanics](https://en.wikipedia.org/wiki/Quantum_mechanics).

en.wikipedia.org/wiki/Quantum\_field\_theory

Question:

What is quantum field theory?

Rydberg constant

In [spectroscopy](https://en.wikipedia.org/wiki/Spectroscopy), the **Rydberg constant**,  named after the Swedish [physicist](https://en.wikipedia.org/wiki/Physicist) [Johannes Rydberg](https://en.wikipedia.org/wiki/Johannes_Rydberg), is a [physical constant](https://en.wikipedia.org/wiki/Physical_constant) relating to the electromagnetic [spectra](https://en.wikipedia.org/wiki/Spectrum) of an atom. The constant first arose as an empirical fitting parameter in the [Rydberg formula](https://en.wikipedia.org/wiki/Rydberg_formula) for the [hydrogen spectral series](https://en.wikipedia.org/wiki/Hydrogen_spectral_series), but [Niels Bohr](https://en.wikipedia.org/wiki/Niels_Bohr) later showed that its value could be calculated from more fundamental constants according to his [model of the atom](https://en.wikipedia.org/wiki/Bohr_model).

en.wikipedia.org/wiki/Rydberg\_constant

Question:

What is Rydberg constant?

Questions from students:

Generally, laws describe what will happen in a given situation as demonstrable by a mathematical equation, whereas theories describe how the phenomenon happens.

Google

Question:

What are the differences between law and theory?

Question:

What was before the Big Bang?

Question:

What are the differences between weight and mass?

Question:

Can quantum computer help with theory of everything?

Question:

How can people be teleported?

Pauli exclusion principle

Parity violation

Teleportation

Entanglement

Quantum cryptography

Polarization

Quantum chromodynamics

Bose-Einstein condensate

Nuclear reactor

Nuclear weapons

Question:

Explain main concepts, laws and theories of the physics.