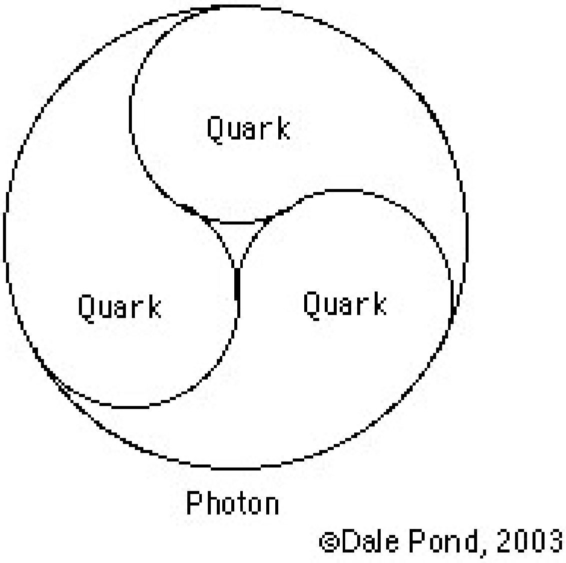
Photon



"*To detect the momentum of a* ***photon****, one actually detects the momentum of an interacting particle of mass.* ***Photons*** *as such are not directly detectable. Indeed, the* ***photon*** *is not just a "massless particle" and no one really understands just what it is.*" [See Richard Kidd, James Ardini, and Anatol Anton, Evolution of the Modern Photon, American Journal of Physics, 57(1), Jan. 1989, p. 27-35.]

This term historically was first applied to indivisible amounts of electromagnetic, or light, energy usually referred to as photons. The photon, or quantum of the electromagnetic field, is a massless particle, best interpreted as such by quantizing Maxwell's equations. [McGraw-Hill Concise Encyclopedia of Science & Technology]

Gamma rays energies have **photons** with over 100 million electron volts. In comparison visible light **photons** have energies of about 2 electron volts. [NASA]

Russell

CONFUSION CONCERNING LIGHT CORPUSCLES

There is much confusion concerning the many kinds of particles of matter such as electrons, protons, photons, neutrons and others. These many particles are supposedly different because of the belief that some are negatively charged, some are positively charged and some are so equally charged that one supposedly neutralizes the other.

There is no such condition in nature as negative charge, nor are there negatively charged particles. Charge and discharge are opposite conditions, as filling and emptying, or compressing and expanding are opposite conditions.

Compressing bodies are charging into higher potential conditions. Conversely, expanding bodies are discharging into lower potential conditions. To describe an electron as a negatively charged body is equivalent to saying that it is an expanding-contracting body.

Contracting and expanding bodies move in opposite directions. Contracting bodies move radially inward toward mass centers, and expanding bodies move radially outward toward space which surrounds masses. In this two-way universe, light which is inwardly directed toward gravity charges mass and discharges space. When directed toward space it charges space and discharges mass. All direction of force in Nature is spiral.

The charging condition is positive. It multiplies speed of motion into density of substance. The principle of multiplication of motion because of decrease of volume is the cause of the acceleration of gravity. The discharging condition is negative. It divides speed of motion into tenuity of substance. The principle of the division of motion because of expansion of volume, is the cause of the deceleration of radiation.

One can better comprehend this principle by knowing that what we call substance is purely motion. Motion simulates substance by its variation of pressures, its speed and its gyroscopic relation to its wave axis.

Particles are variously conditioned as to pressure but there are no different kinds of particles. All are light waves wound up into particles which are doubly charged. Their position at any one point in their wave causes them to have the electric condition appropriate for that point.

Light particles are forever moving in their octave waves. All are either heading toward their cathode or their anode, which means toward vacuity or gravity. They are all moving either inward or outward, spirally. [Walter Russell, The Secret of Light, pages 164-166]

(foton) , the particle composing light and other forms of electromagnetic radiation, sometimes called light quantum. The **photon** has no charge and no mass. About the beginning of the 20th cent., the classical theory that light is emitted and absorbed by matter in a continuous stream came under criticism because it led to incorrect predictions about several effects, notably the radiation of light by incandescent bodies (see black body) and the photoelectric effect. These effects can be explained only by assuming that the energy is transferred in discrete packets, or **photons**, the energy of each **photon** being equal to the frequency of the light multiplied by Planck's Constant, h. Because the value of Planck's constant is extremely small (6.62 ? 10 27 erg sec.), the discrete nature of light energy is not evident in most optical phenomena. The light imparts energy and momentum to a charged particle when one of the **photons** collides with it, as is demonstrated by the Compton effect. (source not known)

Photon

Structure:

Quark
Quark
Quark

Characteristics:

01 - no charge
02 - no mass
03 - variable frequency
04 - an elementary particle that is its own antiparticle.
05 - integral-spin particle to which Bose-Einstien Statistics apply.
06 - does not follow the Pauli Exclusion Principle.
07 - is a boson.
08 - integer-spin particle which mediates forces between fermions. Odd spin bosons mediate repulsive forces; even spin bosons mediate attractive forces.
09 - a quantum of electromagnetic radiation.
10 - Photons are carrier particles of electromagnetic interactions.

Antiparticle: Photon

Photons are carrier particles of electromagnetic interactions

W and Z bosons are carrier particles for weak interactions

Boson : An integral spin particle to which Bose-Einstien statistics apply. Such particles do not follow the Pauli exclusion principle. Photons, pions, alpha particles, and nuclei of even mass numbers are examples of bosons. FermiLab

The carrier particle of the electromagnetic interaction. Depending on its frequency (and therefore its energy) photons can have different names such as visible light, X rays and gamma rays. We describe light in several ways. When we talk about "photons" we generally think of uncharged particles with out mass that carry energy (but be careful, there are other particles like this!). Photons of light are known by other names too, such as gamma rays and x-rays. Low-energy forms are called ultraviolet rays, infrared rays, even radio waves! A photon is one of the fundamental particles in nature and it plays an important role involving electron interactions. Photons are the most familiar particles in everyday existence. The light we see, the radiant heat we feel, microwaves we cook with, are make use of photons of different energies. An x-ray is simply a name given to the most energetic of these particles.

PHOTON (foton) , the particle composing light and other forms of electromagnetic radiation, sometimes called light quantum. The photon has no charge and no mass. About the beginning of the 20th cent., the classical theory that light is emitted and absorbed by matter in a continuous stream came under criticism because it led to incorrect predictions about several effects, notably the radiation of light by incandescent bodies (see black body) and the photoelectric effect . These effects can be explained only by assuming that the energy is transferred in discrete packets, or photons, the energy of each photon being equal to the frequency of the light multiplied by Planck's constant, h. Because the value of Planck's constant is extremely small (6.62 ? 10 27 erg sec.), the discrete nature of light energy is not evident in most optical phenomena. The light imparts energy and momentum to a charged particle when one of the photons collides with it, as is demonstrated by the Compton Effect. See quantum theory. Photon is a quantum of electromagnetic radiation; an elementary particle that is its own antiparticle.

Boson An integral spin particle to which Bose-Einstien statistics apply. Such particles do not follow the Pauli exclusion principle. Photons, pions, alpha particles, and nuclei of even mass numbers are examples of bosons. FermiLab

An integer-spin particle which mediates forces between fermions. Odd spin bosons mediate repulsive forces; even spin bosons mediate attractive forces. Bosons of the same type are indistinguishable and have symmetric wavefunctions. Bosons obey Bose-Einstein statistics.

Boson - any particle that obeys Bose-Einstein statistics but not the Pauli exclusion principle; all nuclei with an even mass number are bosons
even spin bosons - mediate attractive forces
gauge boson - a particle that mediates the interaction of two elementary particles
gluon - a gauge boson that mediates strong interaction among quarks
graviton - a gauge boson that mediates the (extremely weak) gravitational interactions between particles
intermediate vector bosons - a gauge boson that mediates weak interactions between particles
Odd spin bosons - mediate repulsive forces
neutral Z bosons - constitute a "neutral current"
photon - a quantum of electromagnetic radiation; an elementary particle that is its own antiparticle

Fermions

Fermions are subatomic particles such as protons, neutrons, and electrons that have half-integer spins (1/2, 3/2, etc) and atoms comprised of odd numbers of the particles such as three. Electrons are fermions.

Unlike bosons, another form of elementary particle that have integer spins (1, 2, 3, etc), identical fermions are prevented by the laws of quantum physics from sharing the same state of being. For example, identical fermions cannot share the same location or momentum. But photons, which are bosons, can - which is why lasers work.

Two fermions that bind strongly into a molecule become a boson because their spins add to an integer value but, in the Colorado experiment, the fermions did not link that tightly. However, they behaved enough like bosons to allow them to share the same momentum for about one ten-thousandth of a second.

Low-temperature superconductors carry current via pairs of electrons that are bound weakly at distances of about a thousand times the usual distance between electrons.

In contrast, the relatively high-temperature superconductors are thought to work when electrons are paired at the average distance between them - and this is what was seen between the atoms in this fermionic condensate.

See Also

Etheric Elements
Figure 7B.09 - Feynmans Triplet Structure of Photon
Force Carrier of Magnetism
Gluon
Light
light as wave and particle
Light Units
Magnetism
Particles and Corpuscles
Quark
shimmer of motes
Table of Quantum Particles