

# A SHORT HISTORY OF THE PHOTON

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Su Zoom

***I therefore take the liberty of proposing for this hypothetical new atom, which is not light but plays an essential part in every process of radiation, the name photon. Gilbert N. Lewis, 1926***

The term "photon" (meaning light, from the Greek φῶς gen. φωτός "phòs, photòs") was coined in Paris in July 1926 by the optical physicist Frithiof Wolfers. A few months later it was reused by the American chemist Gilbert Lewis and suddenly adopted by many physicists, till it became definitive, so that in the modern physics the photon is usually marked with the Greek letter  $\gamma$  (gamma).

Nowadays, the word photon appears ubiquitously in the media, science, and technology, as in art and social reporting. Despite that, the concept of photon and its history are largely unknown and even mistaken, while its notion, as used by various research groups, could hardly be more mystified.

The photon has come a long way, from Einstein's definition, as minimal quantized portion of an electromagnetic wave energy, hence expanding the quantum theory introduced by Planck at the end of the 19th century, via the formal quantization of the electromagnetic field, introduced in the early '30s of the 20th century by E. Fermi and P.M. Dirac, to the research of the 21st century on entangled photons, as resources of quantum cryptography and teleportation. Thus, rendering the photons physics central to the quantum technology of the 21st century.

I hope, with these three lectures, to inseminate the idea that now and then the history of a scientific concept (not of a scientific discovery) hides the evolution of endless expanding thoughts, until reaching the limit of becoming a cognitive, semantic, historical, and philosophical matter. So is the story of the photon.

In this light, my not so hidden intent is also to show how some commentaries, especially in physics textbooks, are markedly under-complex, sometimes overly simplistic or even historically distorted.

