Wave-particle Duality for Light and Matter

In Physics 212 and the first 4 Lectures of Physics 214,
we considered "light" to be a wave.

This was established by experiment in the 19th century (cf. Poisson spot)
Electromagnetic waves exhibit interference and diffraction.

Surprise:

In the early 20th century, it was discovered that
light has particle-like properties
(*e.g.*, localized lumps of energy) in some situations!

Furthermore, matter exhibits wave-like properties
(*e.g.*, electrons, protons, *etc.*) under certain circumstances.

It may seem surprising that an entity might exhibit both
"wave-like" and "particle-like" properties!

Let's look at some of the evidence.