Momentum of a Photon (2)

What is the momentum of a photon?

Combine the two equations:

E_{photon} = hf = hc/λ – quantum mechanics

p = E/c   – Maxwell's equations, or special relativity

This leads to the relation between momentum and wavelength:

p_{photon} = hf/c = h/λ

These are the key relations of quantum mechanics:

$$E = hf$$
$$p = h/\lambda$$

They relate an object's particle properties
    (energy and momentum)
to its wave properties
    (frequency and wavelength).

Remember:
    E = hc/λ
    p = hf/c
are only valid
for photons

So far, we discussed the relations only for light.
But they hold for all matter! We'll discuss this next lecture.