

# Re: Photons

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- *From:* PD <TheDraperFamily@xxxxxxxxxx>
  - *Date:* Fri, 10 Aug 2007 13:18:12 -0000
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On Aug 10, 6:50 am, John Kennaugh  
<J...@xx> wrote:

PD wrote:

On Aug 9, 3:52 am, John Kennaugh  
<J...@xx> wrote:

That is sloppy thinking. In classical electrodynamics circa Maxwell a 'field' was a physical stress in the aether. Action-at-a-distance force between charges was transferred via this stress and the stress could propagate through the aether at  $c$  in the form of light. Despite the fact that relativity owes its existence to Einstein's belief in some sort of aether, the concept of the aether has become highly unfashionable resulting in the almost universal acceptance of the 'no aether doctrine'. The fallout of this is that while physicists still talk in terms of 'fields' the word no longer has a meaning.

It is true that the term "field" means something different than it originally did. That does not mean that it is now without meaning.

I would be obliged if you would explain what meaning it now has.

To explore that deeply would mean opening a book. But I'll give you a head start -- a pointer, if you will.

## Re: Photons

The modern definition of a field means that every point in space (and time) is associated with a \*value\*, such that the value obeys certain constraints and has some physical relevance. Actually, if it is a scalar field, then there is one value associated with each point in spacetime. If it is a vector field, then there are three values associated with each point in spacetime. If it is a 4-vector field, there are four values associated with each point in spacetime. More than one field can apply at each point in spacetime. Laws of physics tell you how something about how the values of a particular field can vary from point to point. For example, the mathematical divergence (which tells you something about how the values of the field can change from point to point) of the vector magnetic field must always be zero, even though there are many configurations of the magnetic field that will satisfy this rule. The divergence of the electric field, on the other hand, does not have to obey this rule, and it obeys a different rule instead. It is also true that if a particle with certain properties inhabits a point where there is a field, then the behavior of that particle will depend on the value(s) of the field at that point.

That's what a field is, for starters. At least that what it's understood to be today, as opposed to 150 years ago.

Anything further read into it --- for example, that the value of the field tells you something about a stress or distortion in some "stuff" at that location --- is usually unwarranted.

PD

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