

# SHORT SIGNAL

UPDATE

JULY, 2006

*Short Signals are about ideas and findings that rise in physics and cosmology, plus our questions and reactions about them.*

## Magical Waves and Spins

I think it safe to say there must be dozens of erudite wave definitions in the literature of modern science. I don't see how it could benefit the reader for me to pick out a few here that seem particularly insufficient. But I can at least agree with the scientists who seem to admit there is not one definition that is found to be altogether satisfactory.

At the core of my discomfiture is what I think of as the Wave Basket. Of course there are a number of circumstances in physics where the word wave has become acceptable. But in particle physics there has been no shortage of instances, in theory and in practice, where somebody who is lacking a distinct cause for a desired result simply reaches into the Wave Basket for a wave idea that is suggestive but vague enough to discourage challenge.

I have just been sent some material containing what appears to be a thoughtful definition of a wave. But the source is not given. Here is the definition, paraphrased of course:

Waves are ways to accomplish the transfer of energy from one point in space to another, without requiring a particle. For example, light and sound travel in that manner. A wave itself can be defined as an oscillation or movement that transfers energy.

Isn't that simple and direct and likeable? I could be forgiven for asking "Oscillation of what?" Or "Movement of what?" After all, people have been asking scientists those questions for generations. But I don't really need to know "what" until we get into the inside of an electron.

Putting aside Who, and Where, and with What Support, let me just say that in recent months -- two or three years, actually -- the literature of particle physics gives evidence of having turned aside from certain teachings that used to make up what elements of the electron were termed attributes. Some are now hard to recognize.

One such element was the point-particle concept: The electron was basically a point without size or shape, but with a determinable position in space. The

electron possessed spin as an attribute, regardless of the old-fashioned idea that a dimensionless point can't engage in spinful activity.

But it legitimately could if a second such point could somehow be involved in the electron's structure. But sadly, the electron in those days was thought to have no structure. Physics was admittedly too busy adding new discoveries to the particle list to take on such a project. But I had begun trying to do so.

Now, according to articles being published during the past year at least, the promising concepts of Supersymmetry have apparently gone into waiting, and accounts of electron structure still give that only the one point -- plus some waves.

I have attempted to cover this subject in the Metaparticle Theory to the degree available to a mathless amateur. In four years our hits and downloading statistics have grown steadily and reached averages well beyond our expectations; but we realize what a disadvantage an undiscovered "second point-pole" would be to particle physics at this time.

But now comes something that really dismays us. It concerns the concept of getting along with only one point-particle in the electron. This is allowed to possess spin -- without having a single dimension. Furthermore, there is not the wispiest mention of a second dimension required to supply exterior structural rotation.

What amazes us most is that somehow there has been bestowed upon this creative work something they call intrinsic angular momentum.

I can only say I will never make it to a hundred if they keep up this sort of magic. Perhaps you'd have to be an octogenarian also to remember this, but angular momentum was once called centrifugal force. You know -- whirl a weighted rope over your head and what keeps the weight sticking straight out there? Now it's called angular momentum. But why strain yourself acting like a cowboy? Let science do the work. With the help of intrinsic angular momentum, the rope should be able to whirl itself around.

How forward-thinking they were, back when they changed the name: Say "intrinsic angular momentum" and it all sounds vaguely unlikely -- but scientific -- to the non-professional science reader. But if what they were saying was "intrinsic centrifugal force", we would all jubilate and say "Wow! How unlikely is it possible to get?"

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