What to Do If You Have a Proposal for the Unified Field Theory?

…and what not to do

Due to volume of e-mail I have received (several thousand at last count) I cannot answer all requests, especially those from individuals who have a new proposal for completing Einstein's dream of a unified field theory, or a new theory of space and time.

However, I would like to give some guidelines for people who have thoughtfully pondered the question of the meaning of space-time.

1) Try to summarize the main idea or theme in a single paragraph. As Einstein once said, unless a theory has a simple underlying picture that the layman can understand, the theory is probably worthless. I will try to answer those proposals which are short and succinct, but I simply do not have time for proposals where the main idea is spread over many pages.

2) If you have a serious proposal for a new physical theory, submit it to a physics journal, just as Physical Review D or Nuclear Physics B. There, it will get the referee and serious attention that it deserves.

3) Remember that your theory will receive more credibility if your theory builds on top of previous theories, rather than making claims like "Einstein was wrong! " For example, our current understanding of the quantum theory and relativity, although incomplete, still gives us a framework for which we have not seen any experimental deviation.

Even Newtonian gravity works quite well within its domain (e.g. small velocities). Relativity is useful in its domain of velocities near the speed of light. However, even relativity breaks down for atomic distances, or gravitational fields found in the center of a black hole or the Big Bang. Similarly, the quantum theory works quite well at atomic distances, but has problems with gravity. A crude combination of the quantum theory and relativity works quite well from sub-atomic distances (10^-15 cm.) to cosmological distances (10^10 km), so your theory must improve on this!

4) Try not to use vague expressions that cannot be formulated precisely or mathematically, such as "time is quantized, " "energy is space, " or "space is twisted, " or "energy is a new dimension," etc. Instead, try to use mathematics to express your ideas. Otherwise, it's hard to understand what you are saying in a precise manner. Many referees will throw out papers which are just a collection of words, equating one mysterious concept (e.g. time) with another (e.g. light). The language of nature is mathematics (e.g. tensor calculus and Lie group theory). Try to formulate your ideas in mathematical form so that the referee has an idea of where you are coming from.

5) Once formulated mathematically, it's then relatively easy for a theoretical physicist to determine the precise nature of the theory. At the very least, your theory must contain the tensor equations of Einstein and the quantum theory of the Standard Model. If they lack these two ingredients, then your theory probably cannot describe nature as we know it. The fundamental problem facing physicists is that General Relativity and the quantum theory, when combined into a single theory, is not "renormalizable, " i.e. the theory blows up and becomes meaningless. Your proposal, therefore, has to give us a finite theory which combines these two formalisms. So

far, only superstring theory can solve this key problem. Important: this means that, at the very minimum, your equations must contain the tensor equations of General Relativity and the Standard Model. If they do not include them, then your theory cannot qualify as a "theory of everything."

6) Most important, try to formulate an experiment that can test your idea. All science is based on reproducible results. No matter how outlandish your idea is, it must be accepted if it holds up experimentally. So try to think up an experiment which will distinguish your result from others. But remember, your theory has to explain the experiments that have already been done, which vindicate General Relativity and the quantum theory.

Good luck!