Ideas in Physics and Astronomy by Gene Preston April 3, 2018

As an electrical engineer I've been fascinated by all things electrical including ham radio, electronics, and electromagnetic waves. I began to suspect in the early 1980s the speed of light might be only a measured constant instead of an absolute constant.

Question 1 – How can we know the speed of light is constant? I set up an experiment assuming light speeds are not constant. The measured speed was always a constant even when the speed of light was changed. I met with John Wheeler, author of the book Gravity, and showed him my experiments. John said he understood what I was saying, but the consensus of physicists is that the speed of light should be treated as an absolute constant. This decision forces use of General Relativity to model gravity. A couple of decades pass and I noticed another worse problem with General Relativity.

Question 2 – Are wavefronts in a passive lossless medium conserved? Yes they are, always. Conservation of wavefronts should be a physical law right up there with conservation of energy and momentum. If you walk into any engineer's, physicist's, or astronomer's office and ask them if electromagnetic wavefronts are conserved they should say yes. Then you tell them General Relativity violates the conservation of wavefronts and they look stunned, possibly angry. We know that photons are seen to change color (frequency) at different gravity potentials. Okun points out the observer is changing instead of the photons https://arxiv.org/pdf/physics/9907017.pdf consistent with the conservation of wavefronts. Wheeler has assumed in his book Gravity that photons are changing frequency without considering the observer. Imagine a set of wavefronts are emitted from a source. At some time later the same wavefronts arrive at a destination. A stationary observer parked anywhere in space will observe all wavefronts are intact and there was no change in frequency anywhere along the way. Now it's necessary the observer not travel to the destination for his observation. The observer must count the wavefronts from a fixed stationary location. This can be done with digital counters and without clocks at any waypoints along the path. The frequency will be observed to be constant and no wavefronts are lost or gained along the pathway. The frequency does not change along the path even if the waves slow down or speed up.

When you combine question 1 with question 2 there is only one possibility in nature for the bending of light by gravity. The light wave changes its speed along the path. The speed of light must be a variable. If you are in a space ship traveling along with the wave you will see the color change but that is due to you inside your spaceship changing, not the wave frequency itself. General Relativity has made an error because wavefronts are not conserved when the frequency of photons in transit is allowed to vary. I wish John Wheeler were still alive so I could discuss this finding with him.

Question 3 – Does Einstein's hardwiring of General Relativity to become asymptotic with Newton's gravity formula for great distances agree with astronomical observations? I have learned within the past couple of years that the answer is definitely no. Since the 1930's astronomers have observed galaxies' outer arms of stars and gas move too fast and also move at a constant speed for a particular galaxy regardless of the distance from the center of the galaxy. I have a paper on this topic posted on line where I derive a new 1/r long range gravity force: http://www.egpreston.com/GravityMod.pdf . This is not curve fitting. The 1/r addition is a fundamental force in addition to our present gravity force. We just don't see it on Earth because the force is too weak.

In accepting General Relativity with its Newton asymptotic formulas, the scientists are forced to introduce dark matter, usually referred to as CDM, cold dark matter. There has been an exhaustive search for an exotic particle that could be the CDM and nothing has been found. Astronomers have been looking for CDM and turned up nothing. One thing noted lately by astronomers is that if CDM is real matter there should be clumping. But there is no clumping observed. In fact, the modeling of CDM shows it must be distributed very smoothly, not indicative of real matter. Some models of multiple galaxies cannot get CDM to work in the models at all. I think astronomers are looking for a new mechanism for what is causing the need for CDM. Is it a 1/r force?

Question 4 – Is gravity caused by mass? The warping of space for gravity forces is probably not just mass, because the Newton type of gravity field inside particles is far too weak. Gravity forces are proportional to mass because each particle contributes to the warping and the sum of all warping sources is proportional to mass. If we look at what might cause space to warp the smoking gun would be the enormous internal forces of particles. The gravity forces we see are probably long range artifacts of what is left over from the strong internal forces as distance from particles is made large.

Question 5 – Does General Relativity suppress new ideas from emerging? The answer is yes. You cannot get a paper posted in any scientific forum of so called "credibility" that disagrees with General Relativity. Therefore new ideas such as this paper are suppressed. As long as new ideas are suppressed we will remain stuck in the endless searching within the confines of the "standard model" never finding an answer.

Question 6 – What can we do with this new model? We should be able to do a lot. It should readily cover what we already know from experiments as well as explain things we don't understand like dark matter and dark energy. We should be able to create a model of the Milky Way galaxy without adding dark matter. I'm working on that now.