

Understanding the Universe From Quarks to the Cosmos

Don Lincoln

This book was written in 2004, which makes it a little dated having been written before the Higgs boson was discovered. Otherwise, it is quite interesting if not suspicious. The world that matters to us mortals is made up of leptons and quarks. The most useful lepton to our existence is the electron. Besides leptons, there are quarks and anti-quarks. They can be in various combinations forming various particles. Three quarks form a proton. The proton luckily does not decay and so also matters to us mortals. Three quarks can come together and form a neutron which also matters to us. It decays in about fifteen minutes unless in the presence of a proton in an atom in which it does not normally decay. All other particles formed by quarks decay very quickly and are not around to mess up the chemistry that we are made of. This is so convenient it looks contrived. One could conclude that Mr. Lincoln wrote a science novel. Say all this is real. What questions arise for those who do not hike the higher hills of the math world?

An explanation is given for the asymmetry of matter and antimatter in the universe. There is also talk of quantum foam in which matter and antimatter come in and out of existence. Could the same argument be applied to the quantum foam as is applied just after the big bang? The universe is large and the quantum foam is everywhere. Is matter continuously being produced over antimatter?

All accounts tell that the universe is expanding. All massive objects are moving away from each other at what is now said to be an accelerating rate. Taking the earth as a reference frame, the total kinetic energy in the universe is increasing. Also, owing to gravity the total potential energy is increasing. Where is all this energy coming from?

A question that none of these writers of physics for the masses ever mentions when telling that the universe is a second old or telling that the universe is an inch big is who is holding the watch and who is holding the yard stick. Time is a parameter. It gives a relation between objects referenced to another object. If the universe was all energy with no matter (objects), there is no time. Massless particles such as photons exist in their reference frame without time or length. In a massless universe length could be measured by wavelength unless the universe was expanding or contracting in which case wavelength would not be a stationary yardstick. Or if used as a yard stick, there would be no measured expansion. So, what is meant by one second? Is it one second of our time or of universe time? If one were holding a clock and the universe was put in reverse, what would the clock read at the point of the big bang? Would it be 13.5 billion years or could it be infinity. Could the big bang have happened in the infinite past depending on what clock one is looking at?

If there are other worlds of intelligent peoples, or say at best educated peoples, would they have the same mathematical explanation of the universe that we (those who walk the high hills of the

math world) have? Could it be that success in explaining the universe is so good that it puts one in a box that they cannot get out of? Just a thought.

From what is told in physics for the masses, the increase in space as the universe expands only applies to objects with a gravitational relationship and at great distances from each other, e.g. galaxies. It does not apply to an atom or it seems between the earth and the sun. If the expansion applied to the solar system and stars in the galaxy, then it would be a pseudo repelling force or real long range force that may have to be taken into account in determining the gravitational constant. It is confusing and not explained.

The book was very good. It would be great to have it updated to when after the Higgs boson was discovered.

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