

MY NOTE ON COSMOLOGICAL CONSTANT PROBLEM
MARCH 2 2017

ZULFIKAR MOINUDDIN AHMED

1. THE OPEN LETTER

THE COSMOLOGICAL CONSTANT PROBLEM AND IT'S SOLUTION In-box

zulfikar.ahmed@gmail.com jzulfikar.ahmed@gmail.com, Attachments Thu, Mar 2, 2017, 3:07 PM

Ladies and Gentlemen,

The most successful scientific theory in history is the Standard Model which you all know. This is a quantum field theory model with 29 parameters for which Higgs sealed the establishment of the paradigm. It does not look like supersymmetry exists in Nature from the results from Large Hadron Collider in Geneva. Briefly, the cosmological constant problem is that there is a measured energy density of the universe by cosmologists which is quite small $\Lambda \sim 10^{-52} m^{-2}$ while the quantum field theory calculation of the quantum vacuum energy is many orders (120) higher. Here is my resolution of the problem: the actual universe can be modeled as an Einstein static model to a first approximation (and I speculate that it is a scaled S4 in reality but let's take the first step to scaled S3 because many people besides myself have already solved the problem without being able to talk about this openly.

STEP 1: On EITHER a 3-sphere or a 4-sphere of fixed radius, light travels by solution of the wave equation which is NOT a plane wave and therefore does NOT satisfy the standard elementary relationship frequency = speed_of_light/wavelength. Instead it satisfies a relationship from wave equation on a sphere given by standard spherical harmonics. This relationship is the CAUSE of why there is a redshift of distant objects in the universe. So step 1 is to throw out big bang.

STEP 2. What is the quantum vacuum on a static Einstein universe? Attached is a paper that calculates the value following quantum field theory on curved spacetime which has been established since the 1960s (Stephen Hawking has used the theory etc. It's established material). The key point is that for the static Einstein universe the radius of the observed universe $\sim 10^{28}$ cm, the quantum vacuum is not 120 orders of magnitude off from the measured cosmological constant. It's quite close.

STEP 3. Is the static Einstein universe stable? This was originally considered the problem with the model. Well, the stability is not as serious a problem and there's a paper on the issue where you can check this attached.

STEP 4. Static Einstein universe solves the quantum gravity problem. See the attached paper.

Date: December 22, 2021.

STEP 5. There is no dark energy. It has not been observed and is not needed because the universe is eternal and had no Big Bang.

The biggest problem is physics today is to fight the Catholic church (Lemaitre) and not the technical problem of quantum gravity. The reason quantum gravity is hard is because no one wants to throw out a persistent creation myth.