The Source of Dark Energy and the Emergence of Dark Matter

Kurt L. Becker

Email: Hainburg1945@hotmail.com

There are other universes beside ours.

Space quanta are flowing between our and other universes.

In the past and continuing to the present time, space quanta, similar to as described in Loop Quantum Gravity theory, are flowing into our Universe at all points at almost even rates. This expansion is different from an expansion in everyday life. The universe expands as a whole. This expansion is described by Hubble's Law.

$$\vec{v} = H_0 \vec{r}$$

$$H_0 = 100\ h\ km^{-1}\ Mpc^{-1}$$

As stated in Modern Cosmology by Andrew Liddle, page 50, h = 0.70 +/- a few per cent. An object with a recession velocity of 7000 km s^{-1} would be expected to be at a distance v / H_0 = 100 Mpc.

As evidence I submit that dark energy does not dilute as our Universe expands, since space quanta are flowing into our Universe.

The direction of flow depends on the state of our or another parallel universe going through a Big Bounce. When a universe is in a state of rapid terminal compression (Big Crunch), then space quanta are flowing out of that universe and into parallel universes. When a universe is in a state of very rapid expansion (Big Bang), then space quanta flow into it from other parallel universes.

The prediction that our universe will expand forever cannot be made at this time, since our expansion or future contraction depends on other universes.

How did gravitational wells emerge at the time of photon decoupling about 378,000 years ago? At that time electrons formed atoms with nuclei and the Universe became transparent to light. More importantly, the cosmic microwave background CMB formed and left us a record of the almost even distribution of matter. The CMB can still be detected today as microwave background radiation. This background is isotropic to 1 in 100,00. Refer to Wikipedia/wiki /Cosmic-microwave-background. At that epoch, hot gases of hydrogen and helium existed. Space quanta continued flowing into our Universe, but did not flow in exactly evenly into all volumes of our Universe. Let us assume that the flow varied by 1 in 100,000. In some regions the quanta of space diluted the hot gases very slightly more, forming gravitational hills. The valleys consisted of less diluted gases**. I posit that the less diluted volumes of our Universe became the gravitational wells needed to start the clumping of matter.**

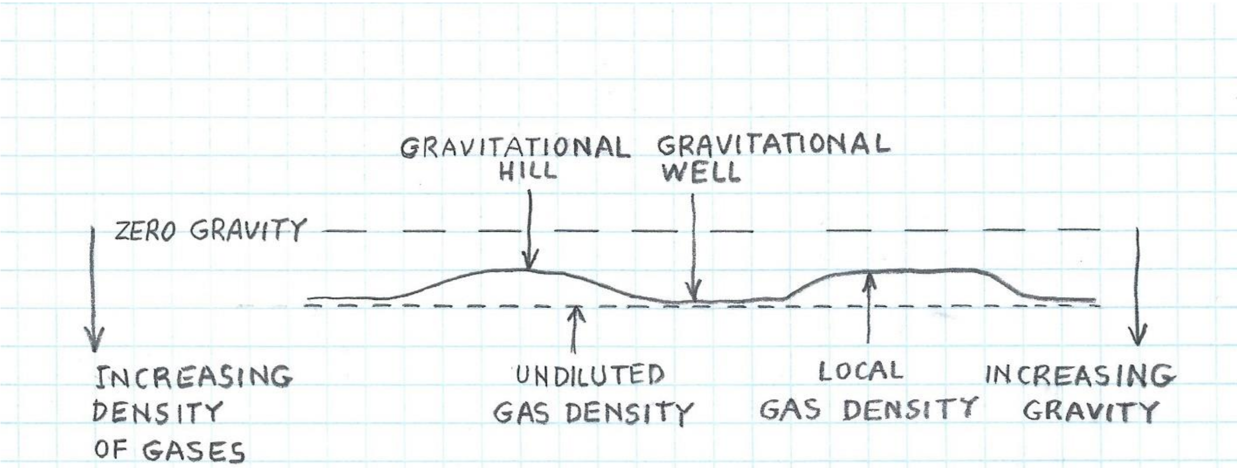

FIG. 1

As evidence I submit the huge walls and voids in our Universe at the very largest of scales.

Once clumping started, gravity was very efficient in forming huge stars and galaxies.

At the galactic scale and larger scales, Modified Newtonian Dynamics, MOND, proposed by M. Milgrom and relativistic Tensor Vector Scalar, TeVeS, developed by J. Bekenstein, best describe gravity.

Please refer to the paper by Ricardo Scarpa: "Modified Newtonian Dynamics, an Introductory Review"

$$a_N = a_M \mu \left(\frac{a_M}{a_0} \right)$$

Where a_N = Newtonian acceleration, a_M = MOND acceleration, $a_0 = 1.2 \times 10^{-10}$ m/s^2 a new constant in physics. When $a_M >> a_0$ then function $\mu = 1$ to retrieve the Newtonian expression in the strong field regime. When $a_M << a_0$ in the weak field regime, then

$$a_M = \sqrt{a_N a_0} = \frac{\sqrt{GMa_0}}{r}$$

With dependence 1/r on distance r from the body of mass M generating the field.

At the scale of our Solar System, Newton's Law of Universal Gravitation, best describes gravity. On Earth and in the Solar System, Newton's laws will always be true, and only need to be modified in certain extreme situations.

$$F_g = \frac{GMm}{r^2}$$