ON A NEWTONIAN COSMOS

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S.P.Smith
contact@stevepsmith.com

ABSTRACT

There are only a few equations used by cosmologists to calculate the current view of the Universe all of which can be extracted often with great difficulty and mathematical gymnastics from Einstein's General Theory of Relativity often covering several pages. Not surprisingly these same equations can also be derived using Newtonian mechanics as Einstein's theory of General Relativity supposedly reduces to Newton's equations. The difference is that using only Newtonian mechanics the same result can be achieved with "relative" ease. The results however are not as expected and require that a more critical analysis of the theories of modern cosmology is in order.

1. Introduction

It has been shown in a different paper that the foundational equation of Newton's laws of gravitation is Kepler, specifically in the calculation from first principles the value of the Gravitational constant "G". This paper takes the additional step of deriving the most commonly used equations in cosmology with the use of General Relativity or complex mathematics and uses only Newtonian mechanics. The results are conclusive and somewhat startling inasmuch as it would appear many of the modern theories of cosmology are in error and should be revisited.

2. Basic Theory

The first equation to be derived from Newton's laws of motion and gravitation is that of Schwarzschild for escape velocity. For this all that is required is Newton's equations representing kinetic and gravitational energy;

$$\frac{Mv^2}{2} = \frac{GMm}{r} \tag{1}$$

Simplify the equation and the result is Schwarzschild's[i] equation for escape velocity;

$$v_e{}^2 = \frac{2GM}{r} \tag{2}$$

From this the escape velocity from cannonballs to rockets can be calculated and also the hypothetical black holes. To analyze black holes another equation is needed from Friedmann, starting with Schwarzschild's equation;

$$v_e{}^2 = \frac{2GM}{r} \tag{3}$$

The value of M is known to be;

$$density = \frac{Mass}{Volume} \tag{4}$$

Therefore mass is;

$$M = \rho V \tag{5}$$

This can be inserted into Schwarzschild's equation to give;

$$v_e{}^2 = \frac{2G\rho V}{r} \tag{6}$$

The volume of a sphere is also known to be;

$$V = \frac{4\pi r^3}{3} \tag{7}$$

Consequently volume can now be replaced in the aforementioned equation (6) to produce;

$$v_e{}^2 = \frac{2G\rho * 4\pi r^3}{r * 3} \tag{8}$$

Simplifying the equation results in;

$$v_e{}^2 = \frac{8\pi G r^2 \rho}{3} \tag{9}$$

Which is of course Friedmann's equation [ii]commonly used to calculate the density of the universe black holes and the like. This can take two pages of mathematics to extract from Einstein's field equation 00 and in the process the true meaning of velocity is completely lost but is assumed by almost everyone to be a recession velocity.

What comes out of the previous equations is that Friedmann's equation nothing more and nothing less than Schwarzschild's equation. The interpretation of velocity is also just as apparent, the velocity cannot be, as is commonly thought, a recession velocity but can only be an escape velocity.

Due to this undeniable conclusion an extremely large spanner is thrown in the works for expanding universes and Hubble's law. The equation cannot represent both escape velocity and recession velocity simultaneously it is one or the other as the equations are undoubtedly equivalent. Being, it is commonplace to calculate the trajectory of rockets and cannonballs with Schwarzschild's equation to a high degree of accuracy, there is no alternative but to assume that Schwarzschild is correct and the velocity is escape velocity and not recession velocity.

It can now be asked what other equations can be calculated, how about Hubble's equation[iii] to calculate the critical density of the Universe.

$$H^2 = \frac{8\pi G\rho}{3v^2} \tag{10}$$

One moment that looks very similar to Friedmann's equation, the only difference is H^2 and v^2. It is thought that;

$$v = H_0 D \therefore H^2 = \frac{v^2}{r^2} \tag{11}$$

Consequently; this can be substituted into the previous equation (10) which results once more in equation (9);

$$v_e^2 = \frac{8\pi G r^2 \rho}{3} \tag{12}$$

This is of course the Friedmann equation again which returns has been show to return a result of escape velocity and not recessional velocity as is commonly thought. This simple analysis can only mean one thing, Hubble's law is erroneous and all of the calculations which use it are likewise erroneous, this includes the big bang, age of the Universe, velocity of expansion critical density black holes and the like.

3. Summary and Conclusions

It has been show how the equations currently used by cosmologists today can be derived using only Newtonian Mechanics. This is of course unsurprising, but what is of greater concern is that this is rarely taught in schools, colleges and universities preferring instead to use derivations from Einstein's Theory of General Relativity. The greatest drawback of this approach is that it would appear that the real identity of velocity in the equations is ambiguous due to the mathematics and is regularly mistaken for recession velocity, when in reality it must always be escape velocity.

Friedmann's equation which is somewhat ubiquitous in modern theories has been shown to be exactly equivalent to Schwarzschild's equation. Because of this the Friedmann equation results in an escape velocity. The Hubble law, being reliant upon the Friedmann equation is therefore also erroneous once more as an escape velocity is returned rather than a recession velocity. Both of these equations are key equations in the understanding of the current standard model of the Universe it is surprising therefore to see that they are both in error resulting from such a basic misunderstanding by almost all cosmologists of the property of velocity.

4. References

[i] *Khatri, Poudel, Gautam, M.K., P.R., A.K. (2010). Principles of Physics. Kathmandu: Ayam Publication. pp. 170, 171. ISBN 9789937903844.*
[ii] *Friedman, A (1999). "On the Curvature of Space". General Relativity and Gravitation.*
[iii] *Edwin Hubble, A Relation between Distance and Radial Velocity among Extra-Galactic Nebulae, Proceedings of the National Academy of Sciences, vol. 15, no. 3, pp. 168-173, March 1929*