

# Inter-Galactic Space Travel

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The present rocket propulsion technology is more primitive than the jungle drum and smoke signal to the communication technology. Not only is the rocket technology archaic it is fraught with danger to space travellers as the recent tragedy bears out. This technology should be applied to making better skyrockets for fireworks displays. The present and future efforts should be applied to the development of a magnetic antigravity machine then develop a technology that will by magnetic means ride on the existing intergalactic space field at velocities many times that of the speed of light.

Gravitation is a physical effect produced by the curvature of a four-dimensional space-time continuum. The effect tells space how to curve and matter how to move within the influence of gravity waves produced by a mass of matter warping near space.

The generalisation of Newton's gravitational potential is the metric tensor  $g_{\mu\nu}$  in terms of which the four-dimensional distance, and hence the geometry of space-time, is determined:

$$ds^2 = \sum_{\mu, \nu=1}^4 g_{\mu\nu} dx^\mu dx^\nu$$

The curvature of space-time is defined in terms of a four index tensor  $R_{\mu\nu\rho\sigma}$ , the curvature tensor. The vanishing of the curvature tensor means no real gravitational field is present. The field equations are ten linear combinations of the curvature components which are of the second order in the derivatives of the metric tensor and are a generalisation of Poisson's equation: where  $\phi$  = gravitational potential which determines the field through a gradient for a spherical earth:  $\phi = -GME/R$  and gravitational field  $G = GME/R$  and the magnitude of the force on mass, M, at point, P, is  $F = MG$ . Strangely, this Newtonian theory assumes a gravitational field fills all space, the force acting on any mass is determined by the field in its proximity and the field exists at any point (P) even in the absence of mass, M. This postulate, with all due respect to Newton, is self-contradictory and relates to Einstein theory very vaguely. However, in general,  $\phi$  will satisfy Poisson's equation:

$$\frac{\partial^2 \phi}{\partial x^2} + \frac{\partial^2 \phi}{\partial y^2} + \frac{\partial^2 \phi}{\partial z^2} = 4\pi\rho$$

Where  $\rho$  = density of matter. The potential energy of mass,  $M_l$ , in the field is expressed in terms of  $\phi$   $v = M_\phi$  in the Newtonian concept the field has no independent dynamical behaviour as does the electromagnetic waves, at any time (t) the Newtonian gravitational field is determined by mass configuration at that instant and does not depend on previous history or state of motion. Thus, if the Sun should vanish, the Earth's gravitational forces would also vanish.

Yet, Newtonian theory implies the gravitational field fills all space, surely the Sun only a medium star and only of importance to a relatively insignificant solar system on the rim of the Milky Way galaxy in fact the solar system could entirely vanish with less significance to the Galaxy than a pail of sand taken from the Sahara Desert. What Newton's postulate should say: The Universal space field (gravitational) should vanish then, gravitational forces of all matter in all space would vanish.

In abstract mathematical format, such a property as Newton's postulate implies, may be thought of in terms of an infinite velocity of propagation for the gravitational field, letting the velocity of light become infinite in Maxwell's equations eliminating all dynamical behaviour for the electromagnetic frequency. In this case, there could be no radio, or TV—Einstein's special theory of relativity is based on the velocity of light in a vacuum being the maximum velocity for transmission of energy in our three-dimensional awareness and four-dimensional cosmos. It is evident Newton's theory needs modifying.

#### The Quantum Viewpoint:

The gravitational interaction among elementary particles is down by a factor of  $10^{-40}$  from the electromagnetic or strong nuclear interactions. Thus, we cannot expect to see the quantum effects at the level of ordinary experiments.

The gravitational field equations are complicated by nonlinear nature. However, from linear approximation the quantised field may be expected to be a spin 2 boson field due to its connection with geometry of space-time, the field is a line among all particles and all interactions.

Einstein states—as an object approaches the speed of light, its inertial mass approaches infinity, as we do not possess infinite power then an object cannot surpass the speed of light or even reach it. This is relative to a three-dimensional frame of reference.

But, as an object approaches the speed of light it proceeds to lose one dimension, at the speed of light the object would be two-dimensional with zero mass, the passage of time, as we sense it, stops.

Now, space that exists beyond the speed-of-light barrier is solid and matter is massless and passes through solid space. Then, if three-dimensional space as we conceive is expanding, and a massless two-dimensionless entity has entered solid space existing in another time frame in which all matter is two-dimensional at zero mass, then an interchange of state exists whereby energy has converted to mass. Thus Einstein's  $E = MC^2$  is valid and  $M = E/C^2$ :

$$E = MC^2 \text{ where } M = 1Kg, C^2 = 5.4976 \times 10^{15} \text{ cm}$$

$$E = (1000)(3.4707 \times 10^{10}) = 3.470 \times 10^{13} \text{ ergs and}$$

$$M = \frac{E}{C^2} = 3.470 \times 10^{13} - 3.470 \times 10^{10} = 1000 \text{ gms or } 1 \text{ Kg}$$

Thus, on the far side of the speed of light, the energy is converted to mass. Mass becomes now dimensionless energy. The limiting velocity of energy through solid mass is mass itself and absolute velocity is  $C^2$ . Thus, intergalactic travel is possible within the relative time frame and a point in space could be reached in  $\approx 1/186,00$  of the time of light would take to reach it. People would age relative to their environmental time frame.

First man must conquer gravity. Then the means of magnetic propulsion will fall into place. Navigation is something else which will evolve with time and new technologies.

Starting here the latter part of this thought was inspired by Gene Hamblin's idea that the Universe is collapsing and time is eternal. On this basis the Universe will collapse forever towards negative infinity but will never reach it. Credit for this part of the idea should go to Gene Hamblin.