

# title - **USING SPACE TRAVEL, T TAURI STARS, $E=mc^2$ AND TERRESTRIAL HONEYBEES TO CONCLUDE THAT ELECTROMAGNETISM IS MODIFIED GRAVITY**

author - Rodney Bartlett

abstract –

Starting with today's generation of rocket thrust by means of the energy-mass relation (as in chemical rockets or ion propulsion), this essay proposes thrust generation through the gravity-electromagnetism relationship (modifying string theory to explain G-EM). Then the statement "T Tauri stars don't generate energy through fusion but rather as a result of gravitational collapse" takes us to  $m=E/c^2$ , Einstein's  $E=mc^2$  solved for mass. It also takes us to the concept that mass does not create gravity, but gravity produces mass as well as the other fundamental forces (this section includes **Dark Energy** and **Dark Matter**). The essay ends with "The paragraphs above show that the magnetic waves are actually modifications of gravitational waves. When they encounter the iron oxide in the bees,  $m=E/c^2$  describes how the interacting forces/energies produce a tiny amount of what we call mass, causing the iron oxide to swell. "

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## **THRUST**

In discussing ion propulsion in which thrust is generated by escaping plasma, "rocketman" (Discover Magazine - May 2014) emphasized the relation of energy and mass. Another way of producing thrust is to emphasize the relation of gravity (G) and electromagnetism (EM). The relation of energy to mass is famously expressed by Einstein's famous formula  $E=mc^2$ : E (energy) equals m (mass) multiplied by  $c^2$  (the velocity of light squared). The relation of gravity to electromagnetism can be expressed as  $G=EM/c^2*c^2$ .

A 2009 electrical-engineering experiment at America's Yale University by electrical engineer Hong Tang and his team demonstrated that, on silicon-chip and transistor scales, light can attract and repel itself like electric charges or magnets. This is the "optical force". For 30 years until his death in 1955, Albert Einstein worked on his Unified Field Theory with the aim of uniting electromagnetism (light is one form of this) and gravitation.

Gravity is the warping of space-time, and it's composed of gravitons at the quantum level. Uniting G and EM to achieve GEM means the microscopic components of space-time warps called gravitons could mimic the Optical Effect and be attracted together, thereby eliminating distance between spaceships and stars/galaxies (this is similar to traversing a wormhole between two folds in space). When Franklin Chang Diaz has finished work on the VArIable Specific Impulse Magnetoplasma Rocket, he might like to design a spacecraft that works according to the Einstein-Yale principle.

## STRINGS AND G-EM

Suppose electromagnetic photons consist of a particular series of 1s and 0s, while gravitational gravitons are made of a different sequence of 1s and 0s. This would help answer Einstein's 1951 question, "Fifty years of pondering have not brought me any closer to answering the question, what are light quanta (photons)?" (Discover Magazine – March 2014, p.31) It also suggests how, as Einstein believed, gravitation and electromagnetism may be related. Finally, it returns us to Professor Max Tegmark's book "Our Mathematical Universe", and his suggestion that the physical world is one big mathematical object (the binary digits of 1 and 0 used in electronics comprise the base-2 form of maths).

String theory suggests everything's ultimately composed of tiny, one-dimensional strings that vibrate as clockwise, standing, and counterclockwise currents in four dimensions - "Workings of the Universe" by Time-Life Books (1991). We can visualize tiny, one-dimensional binary digits of 1 and 0 (base 2 mathematics) forming currents in a two-dimensional program called a Mobius loop – or in 2 Mobius loops, clockwise currents in one loop combining with counterclockwise currents in the other to form a standing current. Combination of the 2 loops' currents requires connection of the two as a four-dimensional Klein bottle (combining 2 Mobius loops in the right way does indeed form a Figure-8 Klein bottle). This connection can be made with the infinitely-long irrational and transcendental numbers. Such an infinite connection translates - via bosons (force-carrying particles) being ultimately composed of the binary digits of 1 and 0 depicting  $\pi$ ,  $e$ ,  $\sqrt{2}$  etc.; and fermions (matter particles) being given mass by bosons interacting in "wave packets" – into an infinite number of Figure-8 Klein bottles which are, in fact, "subuniverses" (we live in a 13.8 billion year old subuniverse). Union of space and time makes the infinite universe eternal - and binary digits fill in gaps and adjust edges of the Klein bottles to fit surrounding subuniverses (similar to manipulation of images by computers). Slight "imperfections" in the way the Mobius loops fit together determine the precise nature of the binary-digit currents (the producers of space-time, gravitational waves, electromagnetic waves, the nuclear strong and weak forces) and thus of exact mass, charge and quantum spin.

## T TAURI STARS AND $m=E/c^2$

"T Tauri stars don't generate energy through fusion but rather as a result of gravitational collapse" (Astronomy magazine - June 2013, p.73) and "A T Tauri star is a stage in a star's formation and evolution right before it becomes a main sequence star. This phase occurs at the end of the protostar phase, when the gravitational pressure holding the star together is the source of all its energy. T Tauri stars don't have enough pressure and temperature at their cores to generate nuclear fusion ..." Read more: <http://www.universetoday.com/24299/types-of-stars/#ixzz31ZZIW41U>.

The highest speed possible is Lightspeed. Physically speaking, it cannot be multiplied. Einstein himself proved this. The equation  $E=mc^2$  can be considered a degenerate form of the mass-energy-momentum relation for vanishing momentum. Einstein was very well aware of this, and in later papers repetitively stressed that his mass-energy equation is strictly limited to observers co-moving with the object under study. The version of the

equation applicable here may be  $E=m/c^2 \cdot c^2$ . Dividing by  $c^2$  then multiplying by  $c^2$  cancels, leaving  $E=m$ . That is, in this case, (gravitational) energy = (T Tauri) matter.

$m = E/c^2$  is  $E=mc^2$  when the formula is solved for mass.  $E=mc^2$  means a tiny amount of mass can be converted into a very large amount of energy. Similarly,  $m=E/c^2$  means a very large amount of energy is converted into a tiny amount of mass. E (energy) is measured in joules (J), m is the mass in kilograms (kg; 1 kg = approx. 2.2 pounds), and c is the speed of light (about 186,282 miles/299,792.458 kilometres per second) measured in metres per second (m/s or  $ms^{-1}$ ). According to "E=mc<sup>2</sup>, Solving the Equation" (<http://www.emc2-explained.info/Emc2/Equation.htm#.UrY7RdIW2bv>), "So from 1kg of matter, any matter, we get  $9 \times 10^{16}$  joules of energy. Writing that out fully we get: 90,000,000,000,000,000 joules (enough to power a 100 watt lightbulb for 28,519,279 years). From gravitational energy equivalent to a 100 watt lightbulb burning for 28,519,279 years, only a kilogram of matter is formed.

## **GRAVITY FORMS MASS AND OTHER FUNDAMENTAL FORCES (INCLUDES DARK ENERGY AND DARK MATTER)**

If space-time (whose warping is gravity) forms mass, there could be "currents" of space-time flowing in the "oceans" between the galaxies. Space-time would form the matter in the galaxies, and it would form the Earth/objects on this planet. How? By some of the currents of space-time or gravity which pass the solar system's outer boundary being diverted towards the massive Sun's centre (just as some of the waves passing an island are refracted toward the shore by the island's mass). Along their course, the refracted gravitational waves are concentrated  $10^{24}$  times in the intense warping we call matter.

When gravity waves concentrate to form matter, gravity travels from external to matter: pushes against matter (repels). Repulsive gravity is dark energy\*. Successive waves are re-radiated at unconcentrated\*\* strength from matter to external (opposite action to repelling wave) and attract – it must be remembered that attraction is merely a matter of perspective, since Einstein showed that attraction of two bodies of matter actually results from space-time's curvature pushing bodies. Calculating time using imaginary numbers makes distinctions between time and space disappear. Hypothetical negative 5<sup>th</sup>-dimension is described by imaginary numbers and motions of its negative particles (dark matter) are time, since time can be calculated using imaginary numbers. So imaginary numbers eliminate distinctions between space-time and 5<sup>th</sup> dimension, permitting dark matter to exist as "ordinary" matter's scaffold.

\* Feeble gravity might push galaxy clusters apart in the same way that feeble sunlight propels a solar sail. In the 1970s, Robert Forward proposed two beam-powered propulsion schemes using either lasers or masers to push giant sails to a significant fraction of the speed of light. These vastly magnify the power of sunlight via Light (or Microwave) Amplification by Stimulated Emission of Radiation. How is gravity's power boosted? When Einstein penned  $E=mc^2$ , he used c ( $c^2$ ) to convert between energy units and mass units. The conversion number is 90,000,000,000 (300,000 km/s x 300,000 km/s) which approx. equals  $10^{11}$ . After gravity forms matter, successive gravity waves are, via gravitational

lensing, concentrated  $10^{24}$  times (to  $10^{25}$ , weak nuclear force's strength). Then they're further magnified by the matter's density to achieve electromagnetism's strength ( $10^{36}$  times gravity's strength) i.e.  $10^{25}$  is multiplied by Einstein's conversion factor [ $10^{11}$ ] and gives  $10^{36}$ . Successive gravity waves are absorbed by the matter and radiated as longer-wavelength waves (both as electromagnetic waves - possibly gamma rays, or a microwave background – and as gravitational waves which have lost  $10^{24}$  of their energy or strength (and are labelled " $10^1$ ".) "If space comes from bits" (specifically, the energy responsible for the bits is converted into space), "then so does gravity (warping of space)." So as more and more energy is invested in bit production, more and more space and repelling gravity result. This causes accelerating expansion within the universe, as discovered in 1998 by Saul Perlmutter, Brian Schmidt, and Adam Riess. (Suppose the unit ascribed to concentrated gravity's strength of  $10^{25}$  is the hertz (Hz), a frequency of one cycle per second. If a gamma ray is emitted from an atom, that typically accounts for more than  $10^{19}$  Hz of the  $10^{25}$  Hz. The remainder's accounted for by radiation of gravitational and other electromagnetic frequencies.)

\*\* Or, possibly, at relatively unconcentrated strength (the number  $10^1$  in the paragraph above would refer to this relatively unconcentrated strength while a strength that's totally unconcentrated and not magnified at all could simply be termed "1"). The gravity waves from deep space would push Jupiter (for example) towards the Sun, while waves from the opposite direction push it away from the Sun. They'd thus cancel and maintain the planet's orbit (in the short term). Over billions of years, Einstein's paper ("Do Gravitational Fields Play An Essential Part In The Structure of the Elementary Particles?" – a 1919 submission to the Prussian Academy of Sciences) implies that planets gradually move farther away because gravity waves that first encounter the sun would help form the solar mass. They'd be diverted to the Sun's centre - during this journey, the increasing density would concentrate and magnify the gravitational waves. Therefore, they'd be more powerful when they emerge from the Sun's opposite side, and gradually push planets farther away (this happens whether planets are orbiting on one side of the sun or on its opposite side). According to "Celestial Mechanics & Dynamical Astronomy", Volume 90, Issue 3-4, pp. 267-288 by Krasinsky, G. A. and Brumberg, V. A., the distance between Sun and Earth is growing by approx. 15 centimetres per century.

## BEES

"20 Things You Didn't Know About... Animal Senses" by Molly Loomis (Discover Magazine – May 2014) says, "Worker honeybees navigate using rings of paramagnetic iron oxide in their abdomens that swell or shrink depending on outside magnetic changes, allowing the insects to find their way home by following changes in the Earth's magnetic fields." As the Chesterfield and District Beekeepers Association says at <http://www.cdbka.org.uk/index.php/bee-keeping/47-members-beekeeping-questions/111-question-no-5-from-d-h-14-10-2012>, "The researchers have found that in a bee, these miniature paramagnetic particles are of natural iron oxide and are aligned either side by side or end to end; and are attached to their respective parent cell walls in the bees' abdomen. As the bee flies around, these cells are affected by the earth's magnetic field due to the bees' position/relationship to the said magnetic field. These particles either swell or shrink

and make subtle changes to the shape of the cells themselves. There are nerves attached to these cells and these cells act like miniature compasses, constantly sending information to the bees' brain identifying its current position."

The paragraphs above show that the magnetic waves are actually modifications of gravitational waves. When they encounter the iron oxide in the bees,  $m=E/c^2$  describes how the interacting forces/energies produce a tiny amount of what we call mass, causing the iron oxide to swell.