Title –

Solar Magnetism in Little Ice Age, Orbits in Solar Ecliptic, Galactic Centre Cloud G0.253+0.016, Speed of Gravity, Collisions of Universes

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Abstract –
The beginning of this article is a few years ago, when I wrote about the Little Ice Age of 1645-1715 and how magnetic fields in the Sun restrict the motion of charged particles. This was followed by a 2013 letter in Astronomy magazine that made me wonder why planets orbit in the Sun's ecliptic plane. I thought about this for awhile and decided my Little Ice Age ideas could help answer the question. Then I read about a solar nebula near the Milky Way's centre which has approx. 45 times the density of gas needed to initiate star formation but is essentially starless, producing no high-mass stars. After some thought, it occurred to me that the ideas concerning the ecliptic could be extended to explain this strange low-star-formation cloud. The original ideas and their extension embrace an idea of Albert Einstein's - subatomic particles forming from gravitation. Continuing my astronomical interests, I read an article called "Why the universe has no center". This inspired a couple of queries (and their possible answers) in my mind – "Can the speed of gravitational waves be both finite and infinite?" and "Can an infinite universe expand?"

Content –

Ecliptic Plane

What do we get if we combine the work of Albert Einstein, the 3 scientists who wrote about The Galactic Center Cloud G0.253+0.016 (Jens Kauffmann, Thushara Pillai and Qizhou Zhang), the 4 scientists who reported results from the Helioseismic and Magnetic Imager (HMI) onboard the Solar Dynamics Observatory satellite (J. R. Kuhn, R. Bush, M. Emilio and I. F. Scholl), the Particle Data Group (an international collaboration that reviews particle physics), and Alfred S. Goldhaber and Michael Martin Nieto (who wrote "Mass of the graviton"), with Dark Energy?

The result begins with this sentence - "the more mass a body possesses, the more gravitation is diverted to play a part in that body's formation". Agreeing with Einstein's theory that gravitation is a push created by the hills and valleys of curved space, gravitational waves are a repelling force (this aspect of gravity is normally referred to as Dark Energy) refracted towards the Sun's centre. The waves ultimately originate far out in deep space where they push galaxy clusters apart. As they pass the solar system's outer boundary, some waves are refracted by the Sun's mass like ocean waves passing an island (some are refracted towards the island and cause waves on its beaches).

Having given the planets pushes which keep them in their orbits and prevent them flying off into space,# the waves arrive at the Sun where they interact with electromagnetism to form the masses of subatomic particles (mass being produced by G-EM interaction was proposed by Einstein in a 1919 paper to the Prussian Academy of Sciences - “Do Gravitational Fields Play An Essential Part In The Structure Of The Elementary Particles Of Matter?”). They also form the strong and weak nuclear forces associated with those particles (nuclear forces are a by-product of G-EM interaction). The rotating Sun bulges at its equator and therefore has a larger equatorial than polar diameter, and more mass at its equator*. This means more gravitation has been diverted to that region. Planets are also made from G and EM interacting, and must consequently lie in the path gravity waves took from the outer solar system to the solar equator (more gravitation was diverted here - so if planets are created by G and EM, it follows that they'd be created where the gravitational "current" is greatest). For simplicity, we say the Sun's gravitation is strongest at its equator and planets are compelled to orbit in the ecliptic plane.

if anybody’s interested, you can read more about gravity’s attractive aspect – and gravitational explanation of dark matter – in “**CHALLENGE – Explain To The Layman How Gravity Accounts For Dark Matter and Dark Energy Without Using Any Mathematics”**, a section within http://viXra.org/abs/1305.0196 It’s just a composite of Newton’s and Einstein’s ideas that explains – in nonmathematical, layman’s language - gravity as a push by gravitational waves that explains dark energy, dark matter, Kepler’s laws of planetary motion, tides, orbits, and apples falling on a 17th-century scientist’s head. It supports Einstein’s idea of gravitational-electromagnetic interaction forming mass, saying gravity is weaker at higher altitudes because it is concentrated in more and more wave packets at lower heights and below a planet’s surface - where it corresponds to higher density, magnification of gravity’s effects, and slowing down of time because motion of the particles is less in greater densities (particle motion increases at lower density, allowing the universe’s highest speed in the vacuum of space).

Little Ice Age

Sunspots form because the sun's equator rotates more quickly than its poles (25 days at the equator, 34 days at the poles). Being “frozen” into its gases, the magnetic field lines of the sun stretch, twist, are drawn out into loops and erupt through the sun's surface, forming sunspots. The intense magnetism of the spots prevents heat from rising to the surface and radiating into space because magnetic fields restrict the motion of charged particles - and infrared photons form charged electrons and protons when they interact with gravity in wave packets (at the most basic level, this process is mathematical and relies on quantum Mobius loops along with their translation into fractally quantum-sized figure-8 Klein bottles). The Maunder Minimum of observations of extremely low sunspot activity from 1645 to 1715 (named after the solar astronomer Edward W.

Maunder [1851-1928]) could actually be attributed to a period of intense sunspot activity. Why? Because a great number of decoupled sunspot vortices (rotating magnetic field lines that remain within the sun) would stop the Earth receiving as much warmth from the Sun. The Maunder Minimum coincided with the middle – and coldest part – of the Little Ice Age during which Europe and North America and perhaps much of the rest of the world saw glaciers advance and rivers freeze; even the Baltic Sea froze over, allowing sledge rides from Poland to Sweden with inns built along the way. The Maunder Minimum would be termed a period of minimum activity coz the sunspots (technically, their increased number of vortices) would not have been visible. The distorted magnetic loops don't have to break through the sun's surface or photosphere but can remain within, forming a rotating vortex that concentrates field lines and can create intense, heat-trapping magnetism.

("Recent observations from the Solar and Heliospheric Observatory [SOHO] using sound waves traveling below the Sun's photosphere [local helioseismology] have been used to develop a three-dimensional image of the internal structure below sunspots; these observations show that there is a powerful downdraft underneath each sunspot, forming a rotating vortex that concentrates the magnetic field." - Wikipedia's "Physics" of "Sunspot".) Therefore, SOHO's observations support the idea that gravitation and electromagnetism are "trapped" in matter/mass-forming wave packets (by analogy with the spacecraft's support for magnetism trapping infrared bosons).

Stellar Nebula

Creation of matter from gravitational-electromagnetic interaction does not mean clouds of gas and dust (and protoplanetary disks) which astronomers consider the likely precursors of, respectively, star and planet formation; cannot be those precursors. As G and EM form matter (perhaps through gravitons and photons being able to transfer mass^ and energy to each other), clouds and disks could be the initial steps that lead to stars and planets. But by themselves, clouds and disks could also be dead ends leading to nothing (see "The Galactic Center Cloud G0.253+0.016: A Massive Dense Cloud with low Star Formation Potential" by Jens Kauffmann, Thushara Pillai, Qizhou Zhang (The Astrophysical Journal Letters Volume 765 Number 2 and http://arxiv.org/abs/1301.1338) which states, "This cloud is very dense, and concentrates a mass exceeding the Orion Molecular Cloud Complex (2x10^5 M_sun) into a radius of only 3pc, but it is essentially starless."

* Although the Sun is nearly the roundest object ever measured, recent results from the Helioseismic and Magnetic Imager (HMI) onboard the Solar Dynamics Observatory satellite indicate that if the Sun were shrunk to a ball one metre in diameter, its equatorial diameter would be 17 millionths of a metre larger than the diameter through its North-South pole, which is its rotation axis. (http://www.sciencedaily.com/releases/2012/08/120816150801.htm and J. R. Kuhn, R. Bush, M. Emilio, I. F. Scholl. **The Precise Solar Shape and Its**

Variability. *Science*, 2012)

^ When gravitons and photons transfer energy to each other, E=mc^2 ("Does the Inertia of a Body Depend Upon Its Energy Content?" by Albert Einstein - "Annalen der Physik" - November 21, 1905) says the relation of mass to energy means they're transferring mass, too. Another way to view their interaction is – the product of gravity interacting with electromagnetism is what we call "mass"; the gravitons and photons therefore give mass to each other. Experiments conducted by the Particle Data Group ("Review of Particle Physics" - Physics Letters B, Volume 667, Issues 1–5, 11 September 2008, Pages 1–6) say the mass of a single photon is no more than 10^-18 eV/c^2.
"Mass of the graviton" by Alfred S. Goldhaber and Michael Martin Nieto - Phys. Rev. D 9, 1119–1121 (1974) - says "…although it is not known if the graviton exists, one can still say that its rest mass is less than 2×10^{-62} g. It's important to note that this paragraph is referring to either subluminal or rest mass of the photon. In other articles e.g. "Equation Describing the Universe" (http://vixra.org/abs/1305.0030), I refer to photons as massless. This is their state at the speed of light, as the following paragraph explains –

"It's impossible to point to the 4th dimension of time, so this cannot be physical. Since the union of space-time is well established in modern science, we can assume the 4th dimension is actually measurement of the motions of the particles occurring in the 3 dimensions of length, width, and height. The basic standard of time in the universe is the measurement of the motions of photons - specifically, of the speed of light. This is comparable to the 1960's adoption on Earth of the measurement of time as the vibration rate of cesium atoms. At lightspeed, time = 0 (it is stopped). Below 300,000 km/sec, acceleration or gravitation causes time dilation (slowing of time as the speed of light is approached). If time's 0, space is also 0 because space and time coexist as space-time whose warping (gravity) is necessarily 0 too. Spacetime/gravity form matter/mass, so the latter pair can't exist at lightspeed and photons are massless."

So to form a star or planet, a specific type of gravitational-electromagnetic interaction is necessary in addition to a solar nebula or protoplanetary disk.

Can the speed of gravitational waves be both finite and infinite?

There is no limit on how fast space-time can stretch. The expansion can be much faster than the speed of light. ("Why the universe has no center" by Liz Kruesi– Astronomy magazine, May 2013) Einstein said gravity is the curvature of space. If there is no speed limit to the stretching of space, then there is no limit on how fast gravitational waves travel and Isaac Newton was correct to think the effects of gravity can be instantaneous. Gravitational damping (the rate of energy loss in, say, the Hulse-Taylor binary pulsar system - Taylor, J. H.; Weisberg, J. M. [1989]. "Further experimental tests of relativistic gravity using the binary pulsar

PSR 1913 + 16".Astrophysical Journal 345: 434–450) does not imply that gravity's speed cannot be infinite. Just as there is no upper limit to the speed of gravity waves, there is no lower limit on how fast space-time can stretch.

Can an infinite universe expand?

Bob Berman's article "Infinite Universe" ("Astronomy" – Nov. 2012) says, "The evidence keeps flooding in. It now truly appears that the universe is infinite" and "Many separate areas of investigation – like baryon acoustic oscillations (sound waves propagating through the denser early universe), the way type 1a supernovae compare with redshift, the Hubble constant, studies of cosmic large-scale structure, and the flat topology of space – all point the same way." Support for the article –

After examining recent measurements by the Wilkinson Microwave Anisotropy Probe, NASA declared "We now know that the universe is flat with only a 0.4% margin of error. This suggests that the Universe is infinite in extent" - http://map.gsfc.nasa.gov/universe/uni_shape.html;
and according to "The Early Universe and the Cosmic Microwave Background: Theory and Observations" by Norma G. Sànchez, Yuri N. Parijskij [published by Springer, 31/12/2003], the shape of the Universe found to best fit observational data is the infinite flat model).

The evidence indicates that the universe is physically infinite. Evidence also indicates the universe is expanding (Hubble, Edwin, "A Relation between Distance and Radial Velocity among Extra-Galactic Nebulae" [1929] Proceedings of the National Academy of Sciences of the United States of America, Volume 15, Issue 3, pp. 168-173). How can the infinite expand? We could simply say it obviously doesn't; and cling to the old concept of a finite space without an edge (like the surface of a sphere). But this would be an incomplete explanation. It makes sense that the infinite universe is static and that it consists of an infinite number of expanding "subuniverses". As one of these expands, it collides with its neighbours and their galaxies enter its space. This idea reminds us of the idea that inflation may have created multiple universes, as well as collision of universes in the Steinhardt-Turok model (see "Cosmic evolution in a cyclic universe" by Paul Steinhardt and Neil Turok - Phys. Rev. D 65, 126003 [2002] [20 pages]). Also see "Will Our Universe Collide With a Neighboring One?" By Zeeya Merali - October 2009 **http://discovermagazine.com/2009/oct/04-will-our-universe-collide-with-neighboring-one#.UY3YTKL-Gbs** It speaks of the "axis of evil", an unexpected alignment of cold and hot (denser and less dense) spots in the cosmic microwave background; one of the possible explanations of this being collision with another universe (other proposals are that the universe's inflation wasn't perfectly symmetrical, and that the entire universe is rotating). Whereas inflation suggests separation between universes and formation of a "multiverse", the idea of expanding subuniverses suggests unification of the subuniverses as inseparable parts of the greater universe.

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