Haumea Ring Destroys Accretion Model

Why the Accretion Model (AM) is inadequate for ring formation, as demonstrated by Haumea; favoring the electromagnetic Coalescence Model

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ABSTRACT

Analysis of the mass, volume, and density data of the Solar System, and in particular Haumea presents a severe difficulty for the Accretion Model[1]. The presence of a ring around Haumea places doubt into the Accretion Model, which had been said to gather all the local dust and grains in an accelerating accumulation within a spherical bubble. Instead, it has been found that the very rotation of the Kuiper Belt objects tends to enhance the effect of ring containment. Calculations of local forces place hard constraints on dust to dust forces, as actual dust density within the solar system is extremely small at usually 7.1 atoms per cubic cm. Therefore, spacing of the dust is almost assuredly too far to provide for mechanistic gravitics. Instead, the author favors and encourages at least an Alfvenian Coalescence Model, if not a more Active Electromagnetic CM, such as a Thornhill-Scott model, or Marklund Convection (plasma coagulations). The author also discusses anomalies of the planets Saturn and Uranus in satellite densities, as compared to Neptune and Jupiter, and connects these to mythic reports and solar system evidence, such as retrograde orbits, tilts, etc.

Keywords: Haumea - Accretion - Rings - Coalescence - Alfven - Gravity

[1] Ie - the Jeans Model; https://en.wikipedia.org/wiki/Nebular_hypothesis

Synopsis

Dwarf planets are low mass planetoids. In the solar system, the average mass of satellite objects, including planets is 4.76 x 10^{25} kg, with planet mass averaging at 3.33 x 10^{26} kg and dwarf planets (sun orbiting objects) at 6.18 x 10^{21} kg.[2] This makes the average densities 1.86 g/m^3, 2.96 g/m^3, and 1.64 g/m^3 respectively, based on data from NASA[3].

The author, however is not interested in auditing mass and density data (though he agrees that the density for Haumea must be below 2.6 g/m^3 [4] and is in fact as low as 1.67 g/m^3. It is interesting to note that Ortiz et al. cite the range of density as between 1.757 and 1.885, as this upper limit matches the solar system's average density from the author's calculations. This is very close to the average density for dwarf planets as well, with a deviation of only 1.83%. This makes Haumea 'optimal' for the study of the dust/AM/ring cosmology, and perhaps accretion in general[5].

The author has used the mass and density calculations from Ortiz et al., as well as Kovac & Regaly (2018)[6], as well as estimates of space dust M/D values from Braga-Ribas et al. (2014)[7] to formulate the gravity calculations[8].

It can be stated that without a non-mechanistic connection between the grains of dust occurring in space, that there is almost certainly no way to guarantee accretion to any appreciable degree. Calculations for the force of gravity between the ring and Haumea, and the moon Hi'iaka and Haumea range in the magnitude of 10^{-10} N. Meanwhile gravity from Haumea to a particle of dust[9] 1 m away[10] is 3.03 x 10^{-10} N. This leads the astronomer to naturally conclude that Haumea can easily hold the ring, and any dust in the vicinity, and even continue to accrete. There are two problems. First is that if the order at 1 m is already at 10^{-10} N how will it be at the roche limit? It will be far weaker, and yet the ring gravity is at the 10^{-10} order. Secondly the problem is that particle to particle forces are on the order of 10^{-20} when giving a generous distance of 1 cm. Likely r = 1 cm will increase the density of the proposed dust clouds well beyond the Kuiper Belt proposed density of 1000 kg/m^3;[11] the solar wind, which may be argued to dominate or even compose the majority of space inside the Kuiper Belt only has an avg density of 7.1 atoms/cm^3.[12] The Earth travels through a dust cloud with roughly the density of 10^{-6} grains/m^3.[13] It is speculated that these grains have an average density of 0.9-1 g/cm^3.[14] In other words, to achieve a similar order of magnitude for Haumea to Hi'iaka, the dust to dust distance must be 1 mm or less.

That isn't an insurmountable problem[15] for CM or ACM, but for AM/mechanistics, where the SM dictates that the fusion sun is the progenitor of the cosmic dust over 4-5 billion years, then another billion years to

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[2] Please see http://bit.ly/2JGFIKo for data inputs to all M/V = D calculations from author
[3] https://solarsystem.nasa.gov
[4] http://digital.csic.es/bitstream/10261/163870/1/IAA_2017_Nature_HaumeaOccultation.pdf p.6
[5] Please note that the author is using accretion/AM to represent the gravitic-mechanistic model of Standard Model (Big-Bang/Dark Universe/Black Hole hybrid), while coalescence/CM will stand for the Alfvenian MHD model, which is somewhat closer to the electro-gravitic active-coalescence model (not discussed in this paper). For more on the Aflvenian model see, "On the Cosmogony of the Solar System," (parts I-3), H. Alfven, 1946
[6] https://arxiv.org/pdf/1807.01904.pdf
[7] https://arxiv.org/pdf/1409.7259.pdf
[8] http://bit.ly/2JmK4Hj
[9] Using 7.53 x 10^{-10} kg;
https://www.algebra.com/algebra/homework/decimal-numbers/decimal-numbers.faq.question.232652.html
[10] r= 816002 m
[11] http://adsabs.harvard.edu/full/1994IAUS..160...31L
[12] https://hypertextbook.com/facts/2005/RandyAbbas.shtml
[13] https://en.wikipedia.org/wiki/Cosmic_dust
[14] http://pluto.jhuapl.edu/Participate/Glossary.php
[15] There is some question as to how the birkeland currents form, given all the current papers relate to co-axial currents in situ. However, the currents do exist. The author can recommend a search for answers in "Electric Currents in Geospace and Beyond," 2018, Wiley/AGU100

accrete.There needs to be proof of this high density. But as stated before, the measured density is only 6-8 atoms for every cubic centimeter. That is obviously far, far below 1 g/cm^3. It is in fact 23 orders of magnitude too low[16].

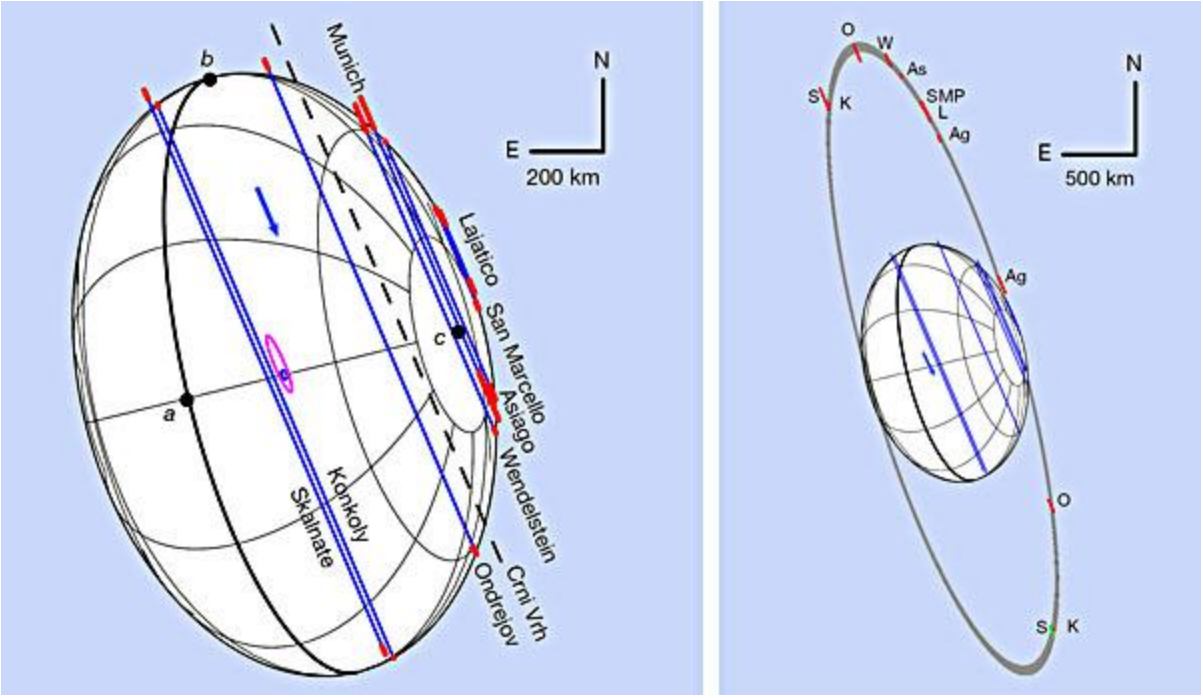

Figure 1 - Haumea Ring system *"These two plots show how 10 successful chords (blue lines with red uncertainties) were used to reconstruct the limb shape of dwarf planet 136108 Haumea left and the location of its ring right during the object's occultation of a star on January 21, 2017. The chord from at Crni Vnh (dashed line) is quite uncertain. Nature / J. L. Ortiz et al"*[17]

[16] http://scienceline.ucsb.edu/getkey.php?key=1168
[17] https://www.skyandtelescope.com/astronomy-news/dwarf-planet-haumea-has-a-ring/

Equations and Tables

$$F = gmMr^{-2},\ g = 6.674\,x\,10^{-11}\,m^{3}kg^{-1}s^{-2} \quad (1)$$

Because we are comparing bodies in a closed system, G divides on both sides of the comparison, as would volume if we substitute d = m/V. We can therefore make the following comparison[18]:

$$d_1 d_2 r_1^{-2} \leq d_3 d_4 r_2^{-2},\ where\ d_1\ may = d_3 \quad (2)$$

All that we are interested in is a comparison of four sets of relationships, as seen in Table 1:

Table 1 - Force Relationships in the Haumea System

Dens Haumea	Dens Ring	r (km)	Fg (N/g)
1.60E+00	1.00E+00	49500	6.53E-10
Dens Hi'iaka	Dens Haumea		
0.50E+00	1.60E+00	49500	3.26E-10
mass Particle	mass Haumea		
4.01E+21	7.53E-10	816	3.03E-10
mass Particle	mass Particle		
7.53E-10	7.53E-10	0.00001	3.78E-25
Alt Dens Haumea	Dens Ring		
1.76E+00	1	49500	7.17E-10

Note - d is in g/cm^3

Using (2) we can see an instructive comparison of the effect of distance (neglecting g), for all the above comparisons. It is easy to justify accretion using the current mass of Haumea, especially considering the low gravity between Haumea and Hi'iaka which obviously is enough. It is more difficult to justify it in the light of shrinking density in dust to dust relationships, which are already constrained past the orbital gravitational force.

If we are to assume that the ring exists as a final distance at which objects will still orbit Haumea[19], rather than be flung into outer space (slingshot), then it follows that 10^{-10} N/g is our minimal order of magnitude for orbit (in this system). That may not prove so for all of the solar system, however it shouldn't vary by more than an order of magnitude, in the author's opinion.

So it follows that if a centimeter of distance is two orders of magnitude below that minimal threshold to achieve orbit, then it should be natural to assume that under no circumstance without an additional force provided by magnetism or electricity, that dust in an unenclosed system obeying ideal gas properties would **ever** accrete.

[18] By assuming that the V cancel out for large bodies, leaving only M
[19] https://en.wikipedia.org/wiki/Roche_limit: 12.2 x 10^6 m (upper limit)

But to be generous, we will add in the volume, and by multiplying these in, just to calculate the forces involved. It will only serve to re-illustrate the ridiculousness of grain to grain gravitics.[20]

Table 2 - Forces between larger bodies, Using volume[21], g, and (1)

Volume Haumea (km^3)	Mass Haumea (kg)	Dens Ring (kg/km3)	r (km)	Fg (N)
2.40E+09	4.01E+21	1.00E+12	37768.5	4.50E+20
Volume Hi'aka	Mass Hi'iaka	Mass Haumea		
1.72E+07	1.79E+19	4.01E+21	49880	1.92E+18
Volume Namaka	mass Haumea	mass dust particle		
2.14E+06	4.01E+21	7.53E-10	816	3.03E-10
	mass Particle	mass Particle	Using (3):	
	7.53E-10	7.53E-10	0.0000000 22762534	7.30E-20

Note - r for the ring is assumed to be an average of the two bodies' orbital distances. It would be preferable if the exact path of dust was known.

$$\sqrt[3]{\frac{X\ atoms}{cm3} \times 6.02x10^{-23} \frac{cm3}{mol\ of\ atoms}} = r\left(\frac{m}{atoms\ spacing}\right) \quad (3)$$

As is shown, at no point does the maximal threshold ever encourage the idea that the gravity between grains is sufficient to cause accretion in the system. It may be that some would say that any force between them will lead towards acceleration. This is true in a mechanistic vacuum. But those opinions tend to discount previous momentum and the acceleration due to the electrostatic force of the Solar Wind upon the non-neutral grains[22][23]. The Coulomb force will be sufficient, in this author's opinion to disrupt clumping. But even if it weren't, please note the disparity in gravitational forces between large bodies and Haumea, and Haumea and a particle. In the presence of such forces, how exactly is it that any dust particles remain free floating in a ring at all? Surely if it is because they are not near the large bodies, then there would be expected to be far more than a ring of dust, but an entire atmosphere of it. That there is a ring at all suggests to the author a structure not only of gravity, but of electromagnetism.

[20] The problem for Jeans' model is it requires acceleration (a Force, which is energy transferred)... where does this energy comes from (a system cannot perform work on itself d/t Thermodynamics)? It cannot happen automatically, so what is accelerating the particles?

[21] The volume of the ring is just assumed to be the size of Haumea, they should be in the same order of magnitude. Ring densities were provided by the authors of the studies cited.

[22] They cannot be neutral as they have been interacting with the solar wind. Also neutral probably does not exist in space, but only in a closed system. Haumea is not an atmosphere-magnetosphere closed system. It is completely exposed to the solar wind.

[23] It isn't clearly proven yet that electricity maintains the Saturnian Rings, but that is suspected. Could it maintain the rings, here? It may be difficult to prove without some measurements of the magnetism around Haumea leading to a realistic calculation of the electric ring current around Haumea which undoubtedly exists.

Solar System Facts

Of the bodies in the solar system, outside the sun, Haumea is the 22nd most dense significant body (of 57 sampled), but it is slightly below the average density of 1.75 g/cm^3. By contrast the Earth is the most dense at 5.44. For overall mass and overall volume, Haumea is 19th.[24] Ignoring Haumea as a host body, and looking only at the 8 standard hosts, we see the following ranking:

Table 3 - Rank by Density (kg/km^3), Volume, and Mass, for planet hosts (satellites only)

Rank	*By Density*	*Satellites Avg Density (x10^{12})*	*By Avg Mass*	*Satellites Avg Mass (kg)*	*By Avg Volume*
1	Earth	3.36	Sun	1.91E+26	Sun
2	Jupiter	2.69	Earth	7.35E+22	Jupiter
3	Sun	2.40	Jupiter	5.62E+22	Earth
4	Pluto	1.66	Saturn	1.08E+22	Saturn
5	Neptune	1.38	Neptune	3.07E+21	Neptune
6	Saturn	1.26	Pluto	1.55E+21	Pluto
7	Uranus	1.15	Uranus	8.28E+20	Uranus
8	Mars	0.916	Mars	6.04E+15	Mars

For Haumea as a host, there is Hi'iaka[25] and Namaka[26] [27]. These make Haumea's satellite density average out to 0.94 which places it near the bottom above Mars. It is assumed that Mars' moons are captured asteroids, given the oddity of the average density, which is more like that of the asteroid belt. This makes the author think that quite likely these 'moons' of Haumea are also in an electro-tidal orbit[28] with Haumea, and in reality the gravity is not sufficient alone to hold even them. This means more than likely they are not formations either via AM or CM, of Haumea specifically. The insistence that these bodies are formed first via small clumpings and then racing towards each other, is only possible under some strong assumptions, starting with larger sized grains, and of course controlling for distance. Also, all the nearest objects need to be moving at more or less the same velocity relative to the sun or they will have such a drastic dropoff in gravitational force they would never, ever become nebularized. Beyond their own microscopic Roche limits they would simply become effectively 0. It doesn't seem to the author that Hi'iaka or Namaka are matching this description, but that may be just a matter of opinion.

Looking at the average masses and volumes of satellites, from Saturn down to Mars, we see a consistency of averages that suggests an underlying order. This is not easily explained by the mass of the host, as Saturn is more massive than Earth, and Pluto is certainly less massive than Uranus. Only Mars seems to make sense. The order ***does*** favor strong electromagnetic fields, because only Mars has a weak magnetosphere here (if it is the same). The most important magnetospheres, aside from the sun are Jupiter, Earth, Saturn and Neptune, while Uranus' is turned sideways (nevertheless is very powerful), suggesting

[24] Ibid., author data based on NASA
[25] https://ipfs.io/ipfs/QmXoypizjW3WknFiJnKLwHCnL72vedxjQkDDP1mXWo6uco/wiki/Hiiaka_(moon).html
[26] https://en.wikipedia.org/wiki/Moons_of_Haumea#Namaka
[27] http://www.johnstonsarchive.net/astro/astmoons/am-136108.html
[28] Electro-tidal orbit is a mutual tidal orbit caused by electrostatic equilibrium between a host and its satellite evidenced by the same side always facing the host.

probably that something catastrophic occured and perhaps a larger, more charged or massive body may have taken some of the massive and dense satellites from Uranus. Myth would suggest Jupiter, but it is not known if a planet Nine may have been involved. Looking at Table 3, comparing the four gas giants' moon masses, it is clear that Uranus seems under-represented as compared to Neptune, its brother; while Saturn also has a surprising number of mid-sized moons.

Table 4 - Comparison of Satellite masses (kg) for Four Gas Giants

Jupiter	1.90E+27	**Saturn**	5.68E+26	**Uranus**	8.68E+25	**Neptune**	1.02E+26
Io	8.93E+22	Janus	2.01E+18	Titania	3.53E+21	Triton	2.14E+22
Europa	4.80E+22	Titan	1.35E+23	Oberon	3.03E+21	Nereid	3.09E+19
Thebe	1.50E+18	Phoebe	8.29E+18	Ariel	1.27E+21	Galatea	3.75E+18
Amalthea	7.17E+18	Enceladus	1.08E+20	Umbriel	1.27E+21	Proteus	4.40E+19
Himalia	6.70E+18	Dione	1.10E+21	Sycorax	2.50E+18	Thalassa	3.50E+17
Ganymede	1.48E+23	Rhea	2.31E+21	Puck	2.90E+18	Despina	2.10E+18
Callisto	1.08E+23	Mimas	3.80E+19	Belinda	3.57E+17	Larissa	4.20E+18
		Iapetus	1.81E+21	Portia	1.68E+18		
		Tethys	6.17E+20	Juliet	5.60E+17		
		Epimetheus	5.27E+17	Caliban	2.50E+17		
		Hyperion	5.62E+18	Miranda	6.59E+16		
		Pandora	2.20E+17				
		Prometheus	1.60E+17				
Averages	**5.62E+22**		**1.08E+22**		**8.28E+20**		**3.07E+21**
%*100 vs host	0.30%		0.19%		0.10%		0.30%
Surface B-field (uT)	550		28		32		27

Note - Significant samples only (r > 40km); Earth's Surface B-field is 38 uT[29]

While Neptune has few significant moons, its average mass for these is higher than Uranus' by an order of magnitude, and its largest is more massive than any of Uranus'. Meanwhile, Jupiter has the lion's share of massive moons, but overall very few significant moons[30], suggesting wide capture of most of its satellites, as indicated by its odd retrograde group[31].

Looking at the % for each where, $\% = \frac{avg\ mass\ of\ satellites}{mass\ of\ host} \times 100$, we can see that Uranus is inordinately low. Both Saturn and Uranus are lower than the equivalent power brothers of Neptune (Poseidon) and Jupiter (Zeus). In the myths we see that Uranus (as Hades) is punished by Zeus for trying to take over Olympus, and is given dominion of the "Underworld" (probably meaning he disappeared from sight into the black of space). Meanwhile Saturn (first as Kronos, then as Hera) was the victim of multiple incidents with Jupiter, and it is

[29] http://www.maths.gla.ac.uk/~rs/res/B/PlanetDyn/Schubert2011.pdf p.2 Table 1
[30] This is significant because of the two groups (prograde and retrograde) of moons surrounding Jupiter and the myths of Set ripping Osiris apart limb by limb.
[31] https://arxiv.org/pdf/1809.00700.pdf

expected that some of the larger masses once belonging to Saturn were either taken, or simply lost to the sun. Most suspect are Earth and Mars[32], which share similar incline angles relative to the solar equatorial plane.

While Pluto's magnetic field strength is not yet known, it can be expected to be surprisingly high. Earth's higher magnetosphere is clearly implicated in the attraction and retention in electro-tidal phase lock of the Moon, which should spin faster under AM to conserve angular momentum[33], but spins 3.5% the rate of its host. Pluto-Charon orbit is a shared barycenter in a similar phase lock, and this probably accounts for its performance as compared to Mars, whose B-field is merely 0.01 uT or less. The Moon is 100 uT or less.

While Uranus has a very strong field overall, some 48x that of Earth[34], it does not appear to be organized in a direction to hold many satellites which will align with the Solar ecliptic (thus suggesting non nebular origins, as is widely accepted for the current position and tilt of Uranus[35]). But Pluto, by contrast must have a strong electromagnetic dynamo, as it is unexpectedly emitting X-rays[36] suggesting internal magma gyres responding to an electric current and transformer behavior[37].

None of this makes sense in SM-AM, but makes perfect sense in a CM such as Alfven's CM, or a more active electro-coalescence model.

It may be noted that the Sun's avg. satellite mass: host %*100 is 0.24% as compared with the gas giants. It has a massive electromagnetic field.

In a final note of interest, the similar density calculations for Table 4 but for Mars, Earth, Haumea, and Pluto are very interesting.

Table 5 - Comparison of Satellite masses (kg) for Rocky Body hosts

Haumea	4.01E+21	**Eris**	1.66E+22	**Earth**	5.97E+24	**Pluto**	1.31E+22
Hi'iaka	1.79E+19	Dysnomia	5.00E+21	Moon	7.35E+22	Charon	1.55E+21
Namaka	1.79E+18		**3009.46%**		**123.04%**	Nix	4.50E+16
	9.85E+18			**Mars**	6.42E+23	Styx	7.50E+15
	24.58%			Phobos	1.06E+16	Kerberos	1.65E+16
2007 OR10	1.75E+21	**Makemake**	2.50E+21	Deimos	1.48E+15	Hydra	4.80E+16
S/2010	1.27E+20	S/2015	3.08E+20	Average	6.04E+15		2.44E+21
	723.33%		**1230.66%**		**0.00%**		**1864.03%**

Note: still %*100, for comparison purposes.

Mars is the most obvious standout, and probably represents an actual kinetic/gravitic capture. You need a very large mass, and you can temporarily capture asteroids which represent very little of the mass. This is similar to the Haumea-particle calculation. But it is thought that Mars will actually lose these moons at some point.[38]

[32] Mars is Aries, but prior to that he was known as Heracles, Hera's Warrior.
[33] In a closed system, a tighter nebular radius would of course increase the rotation weight to conserve angular momentum.
[34] http://www.astronomynotes.com/solarsys/plantblb.htm
[35] https://www.space.com/41076-uranus-weird-til-icy-rock-crash.html
[36] https://www.futurity.org/pluto-x-rays-1248552-2/
[37] More analysis needs to be done, but the author suggests that probably this is the result of the mass differential and rotation speeds of the host and satellite, rather than a "number of turns."
[38] https://news.berkeley.edu/2015/11/23/mars-to-lose-its-largest-moon-but-gain-a-ring/

Of the remaining bodies, none have a similar profile to the gas giant profile. Haumea is actually the closest, and then Earth. It has been recorded by the Sumerians that the Moon is a captured body (and this is verified by the South American myths). So the density of the Moon may be extraordinarily high. However, the Earth-Moon and Pluto-Charon systems represent almost certain electrostatic equilibrium to generate tidal phase lock. The question is if this is ubiquitous with other rocky bodies, mostly TNOs.

Conclusion

Haumea represents a growing body of freakish Trans-Neptunian Objects, which display surprising features[39] such as barycenters not centered on the sun, and ring systems, such as those of Haumea or even Eros. Ring systems all over are presenting new challenges to AM, as they can be growing[40], shrinking[41], even disappearing, or puzzling[42] (as they are unexplainable in SM-AM) because they may improve in density and range with higher spin rates of host bodies[43]. In the case of Haumea, because the ring system can be taken as a constraint for the specific G assignable to Haumea, it has been demonstrated by the author that the mechanistic accretion of cosmic dust is untenable. If it had been tenable, then a body formed by accretion of said dust, rather than exploded nova ejecta (as proposed for Earth, etc.) would have completely formed and there should be no reason for the remaining ring to appear. In this author's opinion, Haumea is one more smoking gun ending the complete reliance upon gravity as a mechanism for controlling the solar system.

Alfven proposed a very intelligent, systematic, and rational cosmogony for the solar system in 1946, and although incomplete, it warrants a re-dusting off the shelf in the wake of surprising density and mass data which favor the mythic account of solar system cosmogony. The author asserts this will be to the benefit of astrophysics in general, given the growing body of "unexplained" results from space observations and new projects. If black holes need to be reconsidered for charge[44], electricity[45], and magnetism, as they are actually plasmoids such as M87[46], then there is little reason to suspect that other bodies would not be guided by these extra forces, or indeed dominated by them. If there are pertinent connections of Birkeland Currents (flux ropes) tying Jupiter to Io[47], or Saturn to Enceladus[48], why would it not be pertinent to discuss the electrostatic and electrodynamic forces at play between all objects when they move through an electric field (solar wind) where each grain is 4-5 V of potential[49]? The motion of magnetospheres in relationship to a giant magnetic dynamo is undoubtedly going to result in transformer behavior characteristics which would interact with host and satellite bodies, and probably imparts information about orbit rate and distance, which will modulate momentum, angle, and other mechanistic characteristics. It would be prudent to investigate this dual relationship, at least until (and if) gravity and the electroweak force are finally resolved into a more complete Force.

Until then, the author proposes the renewal of interest in the Coalescence Model, and a disfavoring of mechanistic Accretion, which has not predicted anything about the solar system[50], and has failed repeatedly when tested within the solar system, or without it[51].

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[39] https://arxiv.org/pdf/1904.06333.pdf
[40] https://www.jpl.nasa.gov/news/news.php?feature=7315
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[44] https://arxiv.org/pdf/1904.04654.pdf
[45] https://arxiv.org/pdf/1712.08414.pdf
[46] The "accretion disk" is clearly a toroid, and conforms perfectly to a Bostickian plasmoid
[47] https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2008JA013968
[48] https://www.nasa.gov/multimedia/imagegallery/image_feature_2069.html
[49] https://arxiv.org/pdf/1808.03389.pdf
[50] Not even high presences of water in an Oort Cloud. Water on Earth may come from dust or even the mantle itself.
[51] See: TRAPPIST-1 and also Jupiter-sized stars, which defy the fusion AM of a gaseous sun.

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