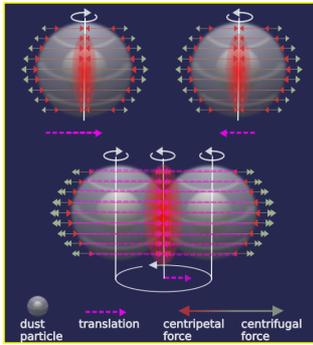


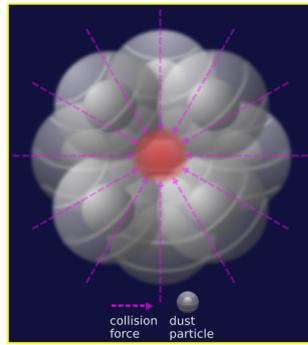
The Making of Black Hole And Galaxy

黑洞與星系的形成

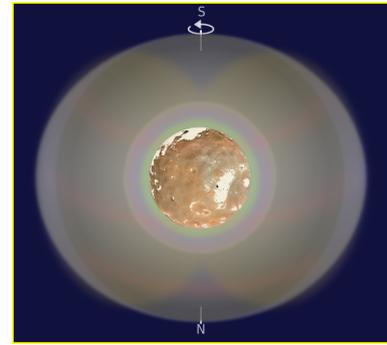
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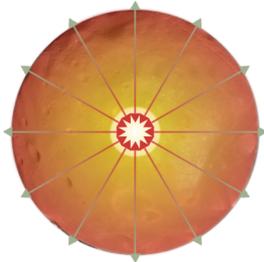
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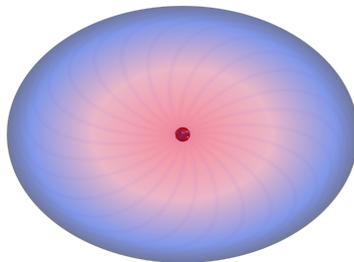
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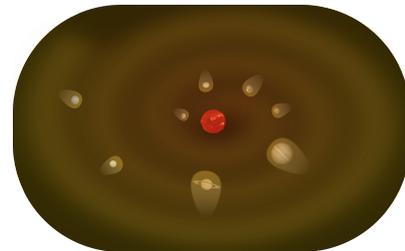
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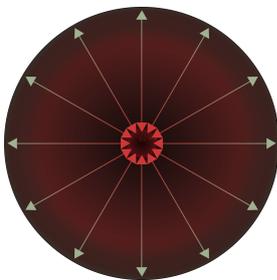
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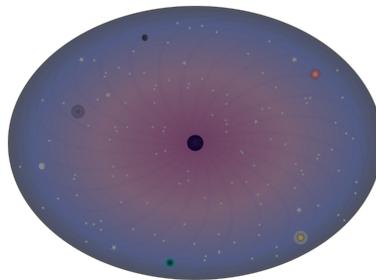
To Vortex Force Field of Expelled Particles



To Spiral Solar System Formation



From Supernova of A Massive Star



To Vortex Force Field of High Energy Particles



To Spiral Galaxy Formation

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Abstract

Nature and human create structure from ground up. Mass grows with collected matter and energy. There is no exception that a structure of larger mass can be made first before the sub-structures. I believe cosmic body can continue to grow despite it is way beyond human term. Super-sized planets can overgrow into a nuclear reaction active stars. And, overgrown stars could have surface hyperactivities beyond our detection and disappear from view.

Expelling particles of a star would create their own opposite imploding force. This implosion force would compress the mass and energy of a star constantly. I don't believe other action can create stronger concentrative force than implosive compression. Which in term intensifies it's surface activities. The intense activities in ultra frequency radiations would excess the limit of our detectors.

Furthermore, there is a limit of a structure can be compressed. A star reaching it's limit would have to explore, a supernova. A super sized star can transform into a high density body by implosion. In either cases, the surface activities would radiate the frequency that is beyond our detection, a black hole disappeared from our view.

I believe a black hole, even invisible, is a super star creates its' own super space storm. It has to be built under the same principles of building a star. Galaxy is a superset of collections including other black holes, solar and planetary systems by nature's inheritance and self-similarity. Even a galaxy, it has to obey the same nature principles with fundamental particles. Not mysterious force that we can not comprehend.

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1 Introduction

Nature and human create structure from ground up. Mass grows with collected matter and energy. There is no exception that a structure of larger mass can be made first before the substructures. I believe cosmic body can continue to grow despite it is way beyond human term. Super-sized planets
5 can overgrow into a nuclear reaction active stars. And, overgrown stars could have surface hyperactivities beyond our detection and disappear from view.

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20 I don't think making of a star, black hole, solar system, galaxy, or cluster of galaxies is mysterious that we can not comprehend. Even galaxy is built from particles. To me, from particle to rock, to planet, to star, then super star (black hole); from planetary to solar system, to galaxy; from supernova to rebirth cycle; are natural process of evolution.

2 Formation of Planet and Gravity Brief

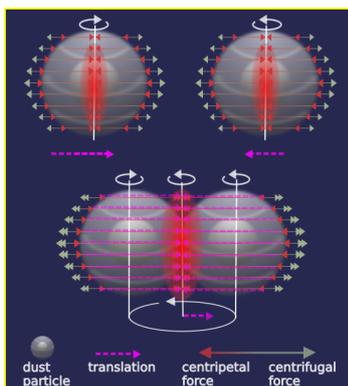


Figure 1: From Particle Collision

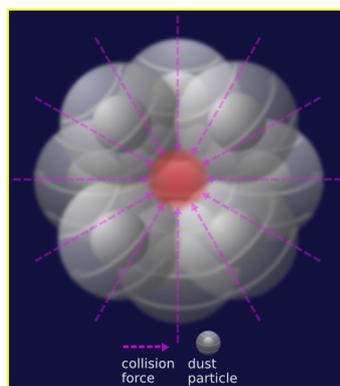


Figure 2: To Rock

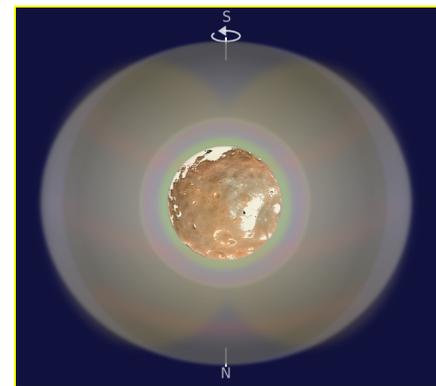


Figure 3: To Planet Formation

Gravity is a force of all elements moving toward same target in uniform acceleration regardless of their differences in composition, shape, size, and distance. Only one momentum can build such one way concentrative force, head-on congregation from gentle pairing to high speed collision. It can be started by electromagnetic attraction-repelling or disturbance in the environment. A terrestrial planet, for example, could be the coalition of dust particles initiated by static electricity. It can also be triggered by reacting to the external disturbance. The coalition builds the body and the force of keeping it together, gravity.

Analogous to rolling a snow ball in space, objects in the path would be picked up. The larger the snow ball grows, the tighter it gets. Matter and the force of union would be incorporated. Dust particles build sand, then rock, and so forth, along with gravity. The momentum is trapped within the structure. All joined elements share this center aiming potential, gravity. Meanwhile, the gathering of mass and energy forms an activity center of building structures and emerging of a plant.

The planet would provide protection for all joined components. By keeping matter and energy in place, it would allow complex interactions to continuing. Physical and chemical processes are protected and governed by the planet. It could continue to grow and develop by interacting with it's environment.

Note: The detail of the study is under *The Making of Planet and Gravity* [2].

3 Formation of Star and Solar System Brief

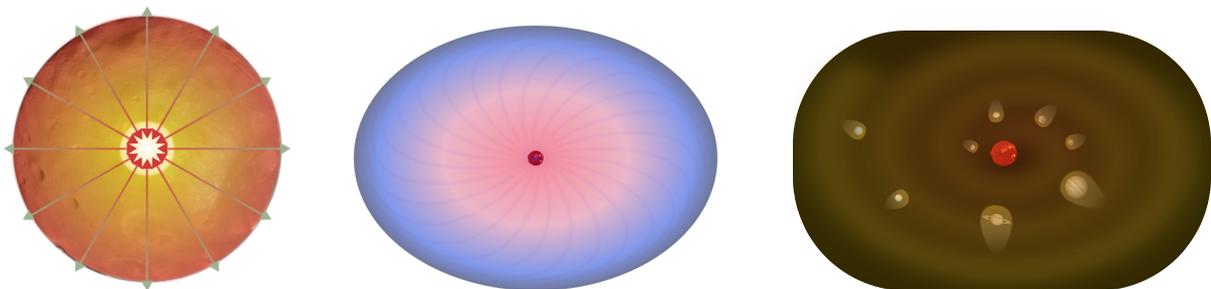


Figure 4: Nuclear Reactions of Massive Planet Figure 5: Vortex Force Field of Expelled Particles Figure 6: Spiral Cyclone of Solar System

To me, the gravity of super-sized planet can trigger global nuclear reactions and become a star. The expelled particles embrace objects in it's path and create a space cyclone, solar system. Our Solar System is a cyclone powered by the vortex force of a single dominating star, the Sun, in weightless space. The Sun regulates the orbits and reduces the collision of all plants and alike within it's reach. The question is, would it be second star if Jupiter got a chance to gather more mass?

Note: The detail of the study is under *The Making of Star and Solar System* [3].

4 Black Hole - Super Star

It is the same principle that we have to push against the ground to run or jump. When a particle is expelled, it also creates a opposing reaction of pushing inward. A star would continue to cumulate the inward force. It's density gets higher in the process of expelling particles by nuclear reaction.

55 This spherical inward-motion of forces compresses matter and energy toward a focal point, gravity center in this case. Logically, the gravity center will have the highest density of matter and energy. Nevertheless, there is a limit of a structure can be compressed. A star reaching it's limit would have to explode. Hence, a supernova. I believe half it it's mass and energy will be thrust outward, and other half inward, if it is a perfect spherical star. By squeezing mass and energy into single point, 60 I don't see other action can create stronger concentrative mass and force than implosive compression. Additionally, I wouldn't rule out the possibility of implosion be a chain event. The half inward implosive force may create second explosion, and more. Stars may look alike, but not structure, mass, and energy. How a complex structure collapsed is determined by it's mass and distribution of mass. A delayed second (and possible next) reaction would be detectable by us. Isn't man-made 65 nuclear explosion an analogy of first explosion/implosion creates second event of nuclear reactions? Nevertheless, the remaining part would have the highest density of mass and energy.

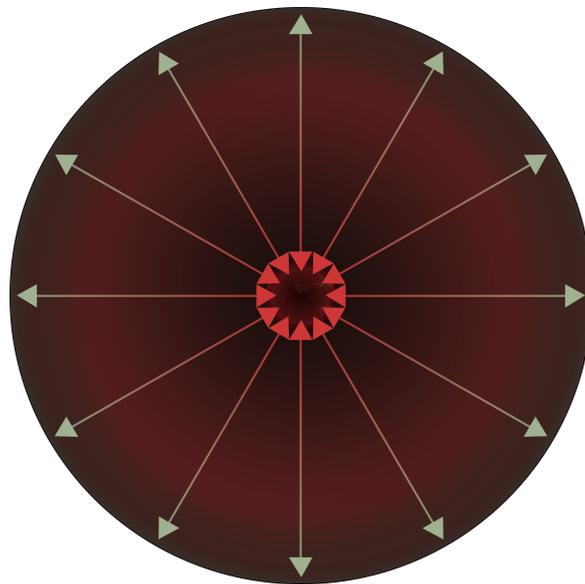


Figure 7: Black Hole Created by Explosion/Implosion of Supernova

The surface activities of the compressed remnant could radiate frequency that is beyond our detection, a black hole, Figure 7. It is my belief that shining we see is the object with surface activities within our visual range. Otherwise it is dark to us. Black holes are objects with hyper surface activities beyond our detection and disappeared from our view.

It is the parallel phenomenon of sound. It is silent when there is no sound, it is also silent if it is beyond the ultrasound. In extreme case, when frequency is approaching infinity, it's wave length

75 would be next to zero. Then, it is as silent as wave length is next to infinite, frequency is approaching zero. Both flat-line our detection. The fact is, we can not see or hear both ends of spectrum in sight and sound. Isn't darkness has two colors of black, and silence has two sounds of quietness? Even we shine a light to a black hole, it would absorb the energy of hyper frequency and disappeared. To see the surface activities of a black hole, our detecting recorder has to be able to resonate it's frequency, 80 then, we can play back in slow motion in sight even sound. It is a tough issue when our detector is slower than the speed of light, and it's sensitivity is also limited. Even we try to detect the reaction of it's environment in the form of waves, the reaction is also hyper active. I don't doubt atomic particles can feel it, however, do you expect it could be realized by us on end?

On the other hand, I don't think supernova always create a denser body. When a structure col- 85 lapse, the distribution of the mass would determined the shape of the implosion and explosion. From red giant, white dwarf, neutron star, black hole, and alike. A star could be torn into fragments by more than one explosion/implosion and form a nebula with no large structure. Nevertheless, the process of formation will begin again. I believe this is how universe recycles matter and energy. Stars never die, never fade away, only rebirth.

90 Additionally, I would not say a black hole can only come from supernova. The surface activities of a star can go beyond our detection simply due to it has reached past the threshold. It became invisible due to hyperactive surface that radiates in frequency beyond our detection. We can no longer tell it is cooler or hotter; and darker or brighter. I would say sunspots[12] could be such hyper active particles. They are revealed by visible background. However, the star could become invisible 95 if is fully covered by sunspots, Figure 8.

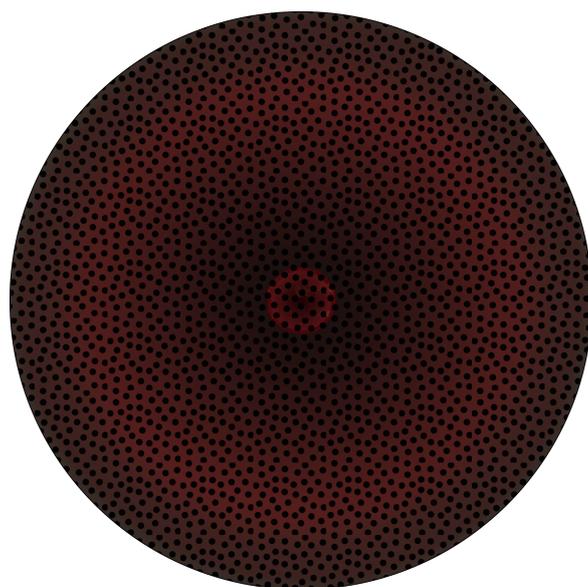


Figure 8: A Massive Star Covered by Sunspots

Certainly, sunspots can be lower and cooler activities of particles. Suppose a distance star disappeared from sight without visible supernova activity; Or, multiple explosions/implosions took place

100 of a distance star; How different, logical or specious, interpretations will emerge?

Nevertheless, I believe the hyper active particles expelled from a black hole will dominate a vast domain much larger than a star. It would overwhelm all subsystems in it's wake.

5 Galaxy - Galactic Cyclone

I believe Milky Way is just a super set of star systems that embraces many subsystems of stars by a
105 dominating black hole. It is a cluster of stars and systems. A massive black hole would be able to catch a large collections of cosmic bodies from nomad planets, star systems, black holes, and alike, Figure 9.

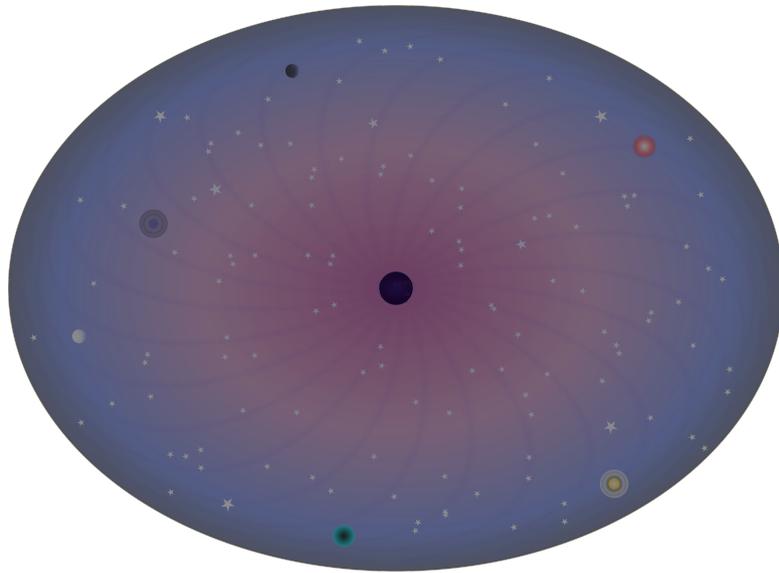


Figure 9: Vortex Force Field of Expelled Particles From Black Hole

110 Galaxy is the largest structure we are able to observe so far. Galaxies many come in all shapes, but noting small. Here is few examples, Figure 10 - 12:



Figure 10:
Irregular[8]

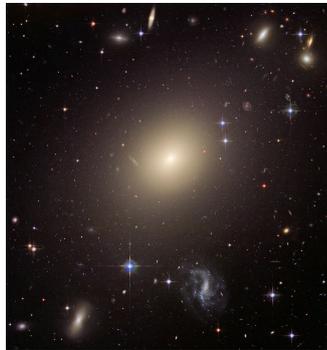


Figure 11:
Elliptical[6]



Figure 12:
Pinwheel[10]

I believe the formation of a galaxy depends on it's structure (compositions) and the environment. They would reform constantly, despite the scale and duration are far beyond us.

115 **6 Galaxy Development, From Irregular To Spiral**

I suspect an irregular galaxy could be at it's early stage of the development. The chance of collision is high in a nebular of clusters of unregulated systems. A black hole may have it's domain dominated and formed a stable system. However, unless it is in a safe neighborhood, it would not be able to avoid the competition from other systems dominated by other black holes. Galactic interaction[7] would
120 continue to build different configurations. A real life analogous phenomena is Fujiwhara Effect [5] of cyclone interaction, Figure 13. Two typhoons interacting with each other in the Philippine Sea on October 6, 2009. And three cyclones spinning over the western Pacific Ocean on August 7, 2006, Figure 14.



Figure 13: Typhoon Parma (left) and Melor (right)

Figure 14: Maria, Bopha, and Saomai

125 NASA image courtesy the MODIS Rapid Response Team at Goddard Space Flight Center.

This vortex force interaction is all around us. It started from atomic world to real life.

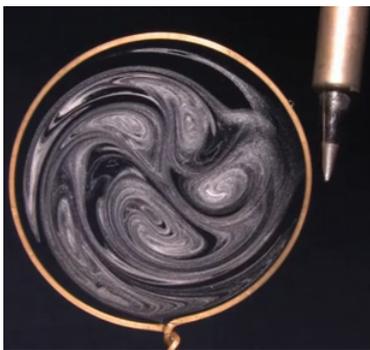


Figure 15: Heat Convection, Don Pettit, ISS[4]



Figure 16: Ocean Current, Wikipedia[11]

Figure 15 and Figure 16 we observed is just a small part of the universal actions. I would not be overwhelmed by the size of galaxy. It is made of black holes, stars, planets, down from atomic particles up. The fundamental force of atomic world will have to be inherited by higher structures. One
130 interesting question is, if the fundamental element was string and the wiggling jiggling action of

string passed onto higher structures, wouldn't we see ribbon and belt objects all around us? Moreover, wouldn't the result of string interaction is entanglement? And, wouldn't the recycle function of the universe is crippled?

135 Whirlpool galaxy, on the other hand, is a stable system like our Solar System and Milky Way, when the competition is monopolized by a massive black hole. Collision would be reduced. The traffic is moving in regulated orbit governed by the domination. To reach this gyroscopic stability of nature, a dominated vertex force field has to be in place. The neighborhood is protected in a disk-shaped structure. It's subsystems could evolve in regulated environment. Complex structures
140 can continue to evolve under it's law and order. To me, writing this study in a stable neighborhood is the blessing of Solar System and Milky Way. Yet, I don't expect Milky Way is operating in a safe neighborhood in long run.

It is not necessary a whirlpool or spiral galaxy is old age. I believe, the competition for the distribution of resources depend on neighbors and neighborhood. Some localities may reach stability
145 fast, other maybe never, or forever in human scale. Isn't it location-location-location in galactic real estate? Nevertheless, it would not stop, universe will continue, with or without the watching eyes of civilization of any type.[1]

7 Summary



Figure 17: Whirlpool Galaxy, Wikipedia



Figure 18: Cyclone Over Iceland, Wikipedia



Figure 19: Cutaway nautilus shell, Wikipedia



Figure 20: Fractal Broccoli, Wikipedia

150 We see the similarity in galaxy, solar system, hurricanes, down to smallest vortex. We also see the self-similarity of life, Figure 17 - Figure 20 [9]. A structure is composed of substructures. To

me, a black hole is a super star of hyper intensive activities beyond our detection. It creates its' own super space cyclone, galaxy, a superset collection of solar and planetary systems by nature's inheritance and self-similarity. As large as galaxy, it is made of fundamental particles. Size, shape, and composition of structures can be different, however, I believe the fundamental principles has to be the same from micro to macro scale. Universe starts from fundamental particles with perfect honesty and commitment. Micro events happen in light speed, and macro event can take billions of years. Galaxy is a superset of collections including other black holes, solar systems, star, plants, and all alike by nature's inheritance and self-similarity. We are not mystified by the making of duct particle and rock. Making of a star, black hole, solar system, galaxy, or cluster of galaxies should not be mysterious force that we can not comprehend.

It's unlikely we will discover all type of galaxies. The diversity of life on a small planet Earth is far excess our imagination. I believe the universe using the fundamental particles can build structures that will continue to surprise us with our slowly opening eyes. So far, what we have observed is less of a blink of eyes. The depressing thought is, a parasitic civilization[1] of human might not be here long enough to see too much more than what already have.

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<https://en.wikipedia.org/wiki/Sunspot>

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