

Demystifying Black holes - A New Rational Explanation on the Workings of Central Core Regions of Galaxies

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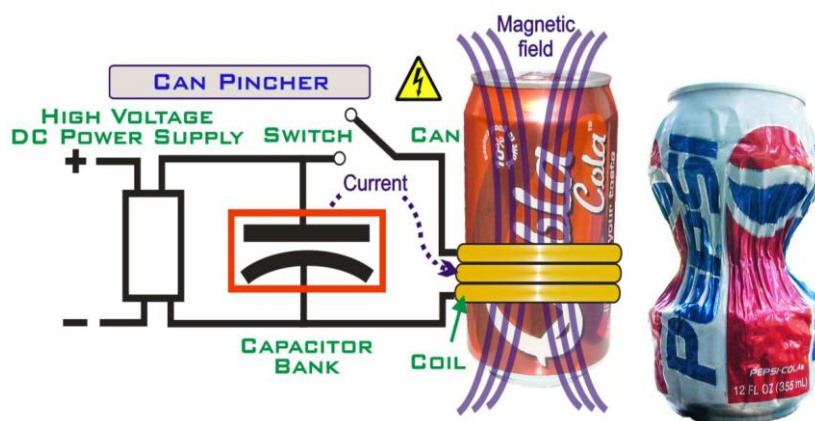
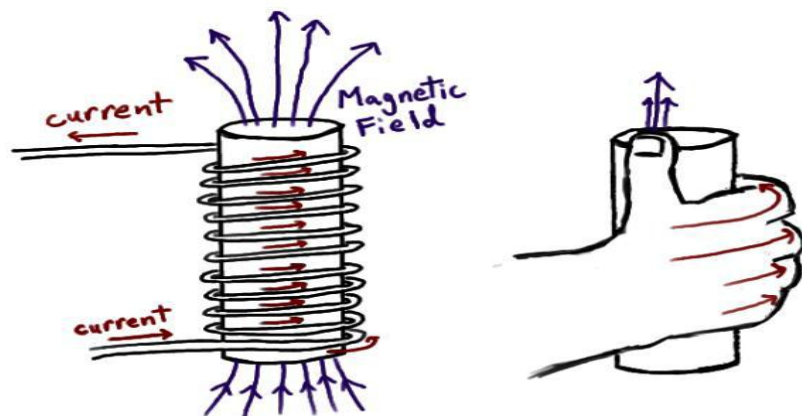
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Abstract

Current mainstream understanding of the galaxies is that they have super-massive black holes in their centres which are mired in mystery in regards to their actual operations and various theoretical models have been invented to describe their behaviour. Most of these Theoretical/Mathematical models are based upon many vague assumptions and are really difficult to understand in a rational manner (i.e. cannot be conceived by one's senses to exist in reality). A more rational explanation is provided in this paper for describing the workings of the inner regions (cores) of galaxies without using any vague mathematical assumptions and using the well understood phenomenon's of electromagnetism as the material inside the core of the galaxies is highly luminous plasma (ionised matter) moving at high speeds and will therefore have strong electromagnetic processes in its workings. The phenomenon of radio type galaxies, Quasars type objects, birth of galaxies and the question of what powers the galaxies are also discussed and a hypothesis proposed for the existence of a fifth state of matter in certain extreme conditions inside the AGN's (in addition to Solid, Liquid, Gas and Plasma state).

A new rational explanation on the workings of central core regions of galaxies

Current mainstream understanding of the galaxies is that they have super-massive black holes in their centre which is obviously fallacious for the simple reason that black holes are purely theoretical concepts invented through mathematics and unlikely to exist (in the forms they are assumed to exist) in the real world if one thinks rationally (Using natural method of reasoning i.e. to see if it is conceivable to exist by one's senses). In order to understand the mechanism of how galaxies function without these mysterious hypothetical creatures we need to first understand the basics of how electromagnetic forces work in a circular moving conductor as that is the structure which forms the core of a galaxy. In the case of galaxies that conductor would be Ionised plasmatic material rotating very fast around the centre of the galaxy at very high temperatures (and quite possibly superconducting as well as the temperatures are ~ Millions Kelvin).



The rapidly rotating circular flows of plasma (Ionised material) will generate huge currents resulting in massive pinch effect in the centre (Lorenz Forces) and will generate strong magnetic fields perpendicular to the plane of the galaxy. The electromagnetic Z-pinch (Lorenz Forces) acting in the centre of the rotating plasma fields acting on a particle of charge q moving with velocity \mathbf{v} in the presence of an electric field \mathbf{E} and a magnetic field \mathbf{B} , will be

$$\mathbf{F} = q[\mathbf{E} + (\mathbf{v} \times \mathbf{B})]$$

The workings of these electromagnetic processes are well understood by people familiar with electricity/electrical currents.



Above image from NASA's Spitzer Space Telescope of Galaxy NGC 1097

Looking at NASA's Spitzer Space Telescope picture above of Galaxy NGC-1097 we clearly see that there is a bright circular ring of plasma with a central object even hotter and brighter (bluish luminosity). This plasma ring is rotating very fast (~thousands of Km per Sec) because gas clouds above this area have been observed to have those speeds around in the centre decreasing in magnitudes moving out wards. This is the structure of the Engine that powers a Galaxy and we can easily explain its operation by applying currently understood knowledge of electromagnetism. The centre of the galaxy consists of *hot* luminous plasma torus ring of captured stars\other material falling in it, rotating very fast around its centre creating massive electrical currents to flow in the circular plasma ring (possibly

superconducting due to high temp.) and this will generate extremely strong magnetic fields perpendicular to the plane of the galaxy with z-pinch zone in the centre of the galaxy as per the known electromagnetic principles. The Z-pinch zone will experience a very strong compression in the middle and will have magnetic fields pushing this material out on both sides in the narrow channels (spindle axis of galaxy) of very strong magnetic field perpendicular to the torus plane generated in accordance with well understood electromagnetism principles.

The highly luminous bluish pinch zone in the middle of this rotating ring of plasma is assumed by astronomers to be a black hole, but it is really an area where the matter is subjected to such a high level of forces that it breaks down to its elementary form and releases huge amount of energy in the process. The forces existing in central regions of a radio type galaxy are the strongest known forces that exist in the observable universe (3×10^{54} joules of mechanical energy in above example)² and the application of this force would likely transform all material into a *new state*.

This *new state* of matter is different from the four states (Solid, Liquid, Gas, Plasma) we are familiar with because in this highly compressed super-hot state the different elemental nuclei's have been collapsed into its fundamental elementary particles (Matter no longer exist in its elemental form) and it will be just a very hot soup of elementary particles and energy. This hot soup (photons + particles) is then ejected from the spindle axis of the plasma ring by the powerful magnetic fields at near superluminal velocities at huge distances. The high energy photons are directed by powerful magnetic force in a laser like high energy beam and the fundamental particles are ejected along the same field. Some of this intense energy generated in Z-pinch will be radiated inwards towards the rotating plasma ring and will transfer energy to it thereby powering the central core engine of the galaxy. This is the process that powers a galaxy and keeps it going for a very long time (much longer than the life cycle of few billion years of an average star)

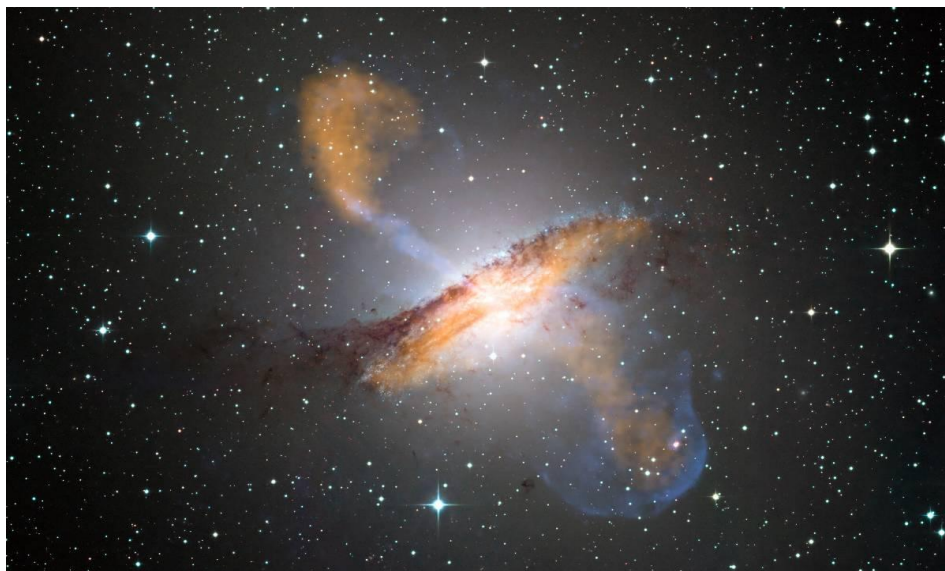
This hypothesis is strengthened by the observation from the emission spectra of similar objects like Blazars (BL Lac Objects) which show no emission lines in their spectra (Which corresponds to the elements present in the source of radiation), but only continuous synchrotron emission. (Electromagnetic radiation emitted when high energy particles are accelerated radially and is the brightest known artificial source of X-rays).

The light from the jets emitted by radio galaxies also shows synchrotron radiation. Most galaxies will have strong X-Ray signatures from their AGN because of this type of synchrotron emission.

This process would explain what we see in all those beautiful Hubble pictures of the galaxies. The fast rotating hot plasmatic material around the centre of the galaxy is continuously feeding itself by sucking all material (including stars) from around it and ejecting material from the centre of galaxy through its spindle axis.

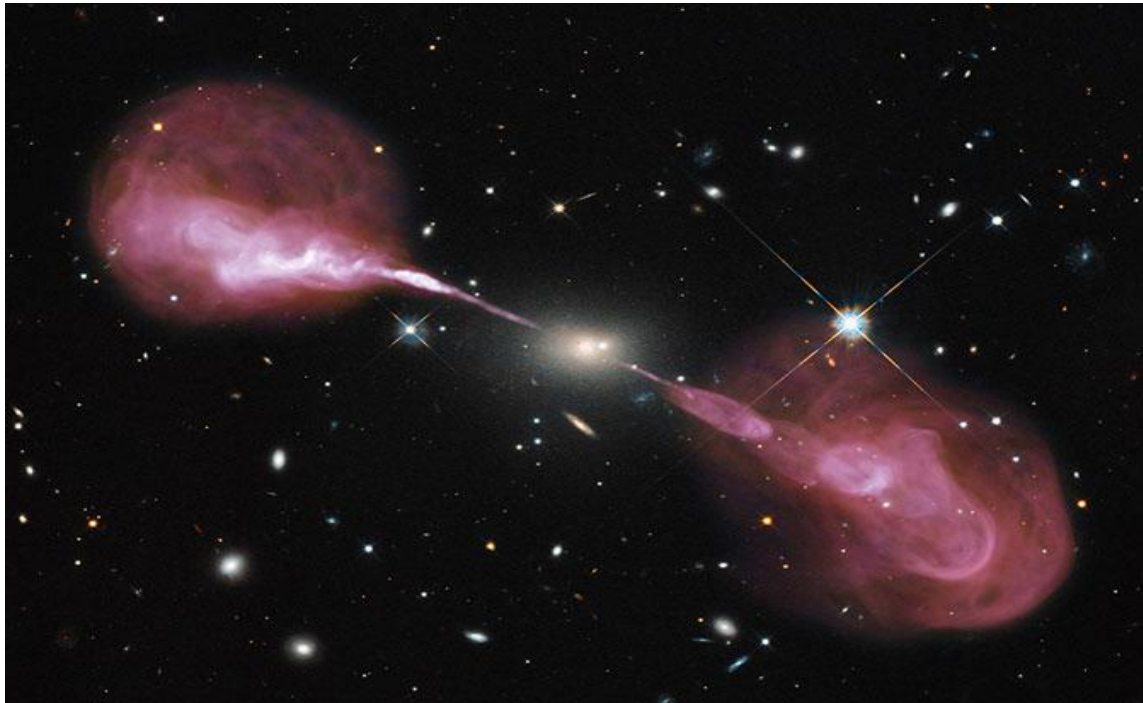


Same Galaxy (NGC 1097) in different image



Colour composite image of Centaurus-A (Wikipedia)

Looking at these galaxies we observe that a vast many of them are nearly dormant in terms of their ejections from the centre while some are observed to eject material ranging from small jets dispersing at a short distance (above example of Centaurus-A) all the way to radio galaxies shooting their jets more than a million light years out on both sides as in example below of galaxy Hercules A.



Hercules A Galaxy

Now these jets shooting out on both sides are a very curious phenomenon in regards to our current understanding of how electromagnetism works. If we assume the material in the centre pinch zone to be a hot soup of charged elementary particles and energy (photons) we would expect the jets ejecting on either side by the powerful magnetic force to separate the charged particles according to their polarities into two opposite streams.

The elementary particles if they exist can only have either clockwise or anti-clockwise spin. (Nature doesn't have +ve and -ve charges at physical level, it only has clockwise and anticlockwise spinning particles and their movement give us the effects of +ve and -ve charge) The extremely strong magnetic field in the Z- pinch zone would separate these clockwise and anticlockwise rotating fundamental particles in the direction of different polarities ejecting them out at near the speed of light on both sides. The jets of these particles after travelling huge distances (million light years in Hercules A above) will lose their energy and will recombine to form atomic particles again. Since these particles in jet streams are in the process of losing energy they will form the lowest energy nuclei's which is hydrogen and helium mainly and that's what we see in the gas clouds formed at the

ends of those jets. This is probably the process that forms the hydrogen helium gas clouds observed at the ends of the radio galaxies.

The dissipation of radio galaxies in this way would complete the lifecycle of a galaxy as this process would convert all material in the galaxy (including heavier elements created by fusion process in stars forming planets etc) into hydrogen and helium mainly. This gas cloud so created would kick-start another round of galaxy\star creation continuing the cycle indefinitely. This process in a way would complete the full cycle of the observable universe i.e. a bit like nature's composting system recycling all star created material back into its elemental form and continuing this cycle forever.

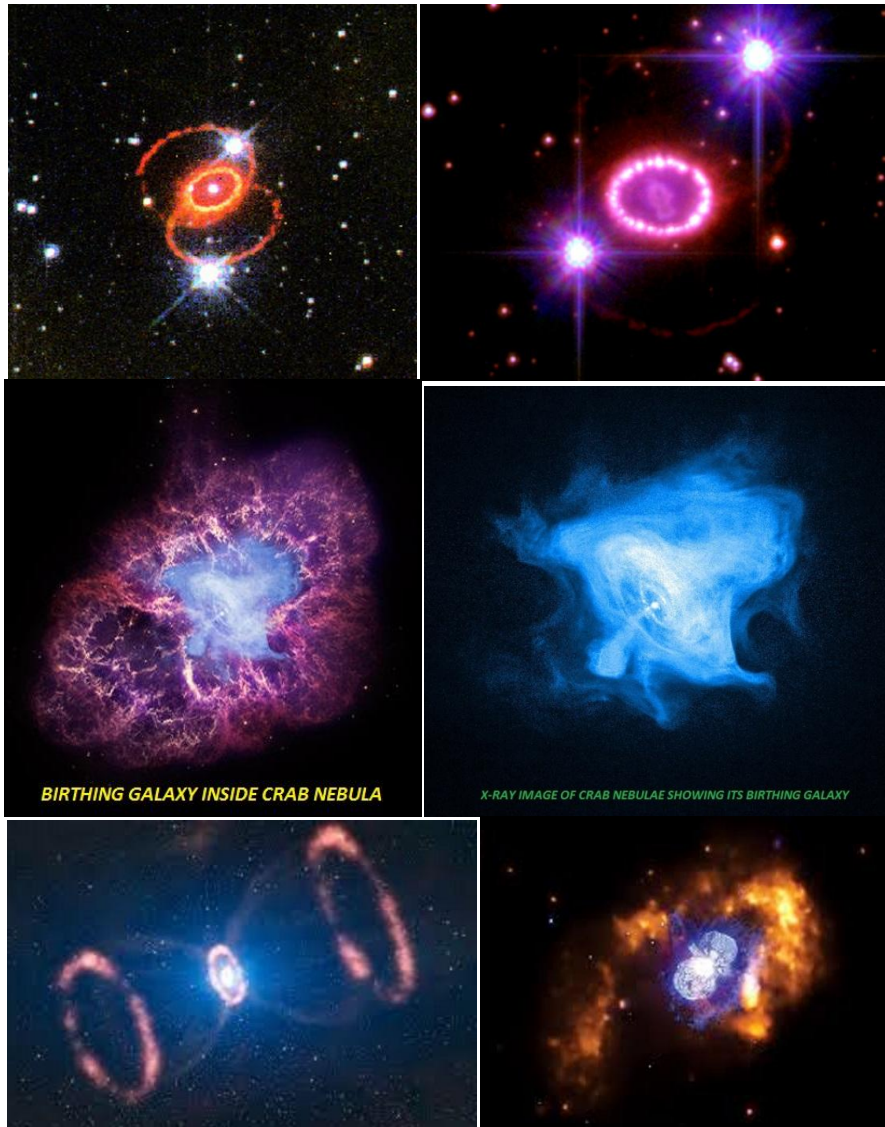
Another observation we can make in this hypothesis is that nature doesn't differentiate between clockwise and anticlockwise fundamental particles when making atomic particles out of them as the gas clouds appear to have similar configurations on both sides of the jets. So nature can be said to be symmetrical at a fundamental level and it uses clockwise/anticlockwise (which are just the mirror images of each other) particles without differentiation/bias in making up of the matter of universe.

On the question of Quasars, Blazars, Birthing galaxies and other such objects.

Galaxies are observed to continually eject these type of objects and they seem to have similar structures (that of AGN) on a mini scale powering their cores as well. In other words these objects are new born galaxies getting ejected out of bigger galaxies and can be easily understood in their functioning if we understand their central core structures.

These objects are pushed out at phenomenal speeds from the centre of their parent galaxy and this is the reason for the wide variation in their observed Hubble red shifts. The difference between the redshift of a Quasar moving towards the observer vs away from the observer will be enormous. These objects are disk shaped and in all different planes of viewing from an observer's point of view, this factor coupled with their very high ejection velocities is the reason for their wide scattering of observed red shift's.

Astronomers mistakenly assume many of these these objects for supernova remnants. Below are some photos of Hubble telescope of these objects considered by astronomers as evidence of supernovae explosions.



If we compare the above so called “supernova explosions” with the below image of *Galaxy NGC 1097* from *NASA's Spitzer Space Telescope* we will immediately recognise that the core engine of galaxy share the same structure as the birthing galaxies above consisting of a ring of hot plasma rotating around its centre and also visible is the shockwave of their creation ejecting out on both sides of the ring.





Depiction of a Quasar type object getting powered by energy radiated from the Z-Pinch centre of its fast rotating plasmatic Torus ring. The extremely powerful electromagnetic pinch transforms the matter into its elementary form releasing massive amounts of energy (Quasars are among the most luminous therefore most energetic objects in the universe). Also seen are the high energy jets (containing elementary particles and ultra high energy laser like photon beam) ejecting on both sides along the magnetic force lines generated by fast rotating ionised plasma torus (possibly superconducting as well). This structure forms the engine that powers all galaxy type structures and continuously generates energy by consuming material from its accretion disk around it.

On the question of when do galaxies become active i.e. start ejecting material from their centre.

At the start of a galaxy's life it is made up of hydrogen, helium mainly but as it continues to grow, its process of star formation converts hydrogen/helium into other heavier elements including iron by the process of fusion in stars. As it continues to age the products of star fusion processes i.e. cooled stars (planets) and other such fragmented material (debris, dust, asteroids etc) will continue to fall into the central plasmatic ring of galaxy powering it. The presence of increasingly larger quantities of material like Iron in the rotating plasmatic core of the galaxy will correspondingly increase the electromagnetic forces generated by it and it is likely that at certain stage they may exceed the forces required to break the nuclei's into its fundamental particles and eject them with the extremely strong magnetic forces so generated. This would also imply that the process that makes a galaxy into active galaxy is not dependent upon its total size only but rather the capacity of its core to generate the critical force (determined by composition, size, temperature and rotational velocity of the core mainly).

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