

# Milky Way's Substance Loop

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**Abstract: Milky Way center exists a star of super huge mass, its called milky way "nuclear-star". Its rotation and gravitation led milky way all substances movement. Super huge mass make it produces super huge center pressure. Super huge center pressure make it produces super high center temperature.**

**Nuclear-star center super high temperature so any substance fissile become photons, and towards all directions jet out photons. Photon side sideswiped make it deceleration becomes low-speed-photon, micro-speed-photon. Magnetic force make micro-speed-photon bond into positive or negative electrons, atoms, molecules, cosmic dust, planets, stars. Micro-speed-photon bond substance's distribution into spherical, radius up to hundreds thousands lightyears. Nuclear-star gravitation and rotation make the spherical change into a flat disc, thus forming milky way galactic disk. Nuclear-star gravity eventually will attract them back to nuclear-star.**

**Milky way the substance hot transpire and cold cohesion constitute milky way's substance loop. Substance form and position determine loop cycle long or short.**

**Key words: Photon, Cosmic dust, Planet, Star, Nuclear-star**

## **0. Foreword**

**Milky Way center exists a star of super huge mass, its called milky way "nuclear-star". Its rotation and gravitation led milky way all substances movement.**

**Its mass exceeds milky way total mass 90%, exceeds sun mass 9 trillion times.**

**Super huge mass make it produces super huge center pressure. Super huge center pressure make it produces super high center temperature.**

**Its center temperature exceeds sun center temperature 20800 times, exceeds 275.446 billion K**

## **1. Milky Way's Substance Hot Transpire**

**Nuclear-star center super high temperature make any substance turn into gasification substance.**

**Nuclear-star center thermal expansion force make it jet out gasification substances from both poles. Eventually making nuclear-star become a sphere of constitute by gasification substances.**

**Come from nuclear-star center, jet out from both poles super high temperature gasification substances, formed super high temperature milky way corona. Super high temperature milky way corona is similar to super high temperature solar corona, was a sphere shape, scale is several trillion times of solar corona.**

**Come from nuclear-star center, jet out from both poles super high temperature gasification substances, in its inside formed two swirl, thereby drive it rotate.**

**Nuclear-star center super high temperature such that any substance fissile become photons.**

**Come from nuclear-star center, jet out from both poles gamma photons form two fermi bubbles.**

**Nuclear-star jet out photon in all directions. Because, photons locus is a circular arc shape. So, photon will inevitably collide with each other.**

**Photon side sideswiped make it deceleration becomes low-speed-photon. Electromagnetic force make low-speed-photon maintain three-dimensional grid orderly arrangement, form an electromagnetic field. Electromagnetic field distribution into spherical, radius up to hundreds thousands lightyears.**

**Low-speed-photon side sideswiped make it deceleration becomes micro-speed-photon. Micro-speed-photon distribution into spherical, radius up to hundreds thousands lightyears.**

## **2. Milky Way's Substance Cold Cohesion**

**From photon to micro-speed-photon the change processes is from hot to cold, from move to quiet, from beeline motion to spin motion the change process. Change is photons motion mode, unchange is photons mass and structure.**

### **2.1 Galactic disk formed**

**Magnetic force make micro-speed-photon bond into positive or negative electrons, atoms, molecules, cosmic dust, planets, stars. Micro-speed-photon bond substance's distribution into spherical, radius up to hundreds thousands lightyears.**

**Nuclear-star gravitation make micro-speed-photon bond substance produce centripetal force. Centripetal force size equal to it and nuclear-star's gravity.**

**Nuclear-star rotation to drive micro-speed-photon bond substance revolution. Revolution so**

that it produce a centrifugal force.

$$F = m * \omega^2 * r,$$

F - centrifugal force, m - object's mass,  $\omega$  - object circular motion's angular velocity, r - object circular motion's radius. Centrifugal force direction is along radial away center.

In same radius spherical surface, same mass micro-speed-photon bond substance centripetal force is equal.

In same radius spherical surface, same mass micro-speed-photon bond substance angular velocity is equal. Centrifugal force is proportional to it and nuclear-star spin axis distance. Centrifugal force direction perpendicular to nuclear-star spin axis.

In same radius spherical surface, in nuclear-star equatorial plane inner, its centrifugal force is maximum, it and nuclear-star radial direction centrifugal force is equal to centrifugal force.

In same radius spherical surface, in nuclear-star equatorial plane outer, its centrifugal force is smaller, it and nuclear-star radial direction centrifugal force is less than centrifugal force.

Centripetal force is more than it and nuclear-star radial direction centrifugal force, it move toward nuclear-star.

Centripetal force is less than it and nuclear-star radial direction centrifugal force, it move away from nuclear-star.

Centripetal force is equal to it and nuclear-star radial direction centrifugal force, it and nuclear-star distance unchanged.

So, in nuclear-star equatorial plane outer, they are distributed very sparse. In nuclear-star equatorial plane inner, they are distributed very dense. Thus forming milky way galactic disk.

Wikipedia data representation, galactic disk is a swirl shape flattened disc. Its mass is about sun one trillion times, radius is about 50000 lightyears, central thick is about 15000 lightyears, edge thick is about 3000~6000 lightyears.

## 2.2 Galactic disk shrink

Nuclear-star rotation speed is changeable.

Nuclear-star absorb substance total mass is more than it eruption photon total mass.

In this case, its rotation speed accelerate, micro-speed-photon bond substance centrifugal force enhanced, nuclear-star absorb substance reduce. Galactic disk substance does not enter nuclear-star, galactic disk substance increased.

Nuclear-star absorb substance total mass is equal to it eruption photon total mass.

In this case, its rotation speed unchanged, micro-speed-photon bond substance centrifugal

**force unchanged, nuclear-star absorb substance unchanged.**

**Galactic disk substance does not enter nuclear-star, galactic disk substance remain unchanged.**

**Nuclear-star absorb substance total mass is less than it eruption photon total mass.**

**In this case, its rotation speed slowing, micro-speed-photon bond substance centrifugal force weakened, nuclear-star absorb substance increased. Galactic disk substance enter nuclear-star, galactic disk substance reduce. Used to make up difference between absorb substance total mass and eruption photon total mass.**

### **3. Milky Way's Substance Loop Cycle**

**Nuclear-star jet out photon, vast majority photon return nuclear-star. Only a very small part low-frequency photons enter other galaxies.**

**Nuclear-star jet out photons return nuclear-star, form a loop. Returned nuclear-star the substance form different, loop cycle is different.**

**Gamma photons loop cycle least. Fermi bubbles gamma photons, after 25000 years guaitou returned nuclear-star. So, gamma photons loop cycle is about 50000 years.**

**Galactic disk inside the micro-speed-photon bond substance loop cycle maximum. Nuclear-star jet out photons, changed to micro-speed-photon bond substance. Via galactic disk shrink, galactic disk inside the micro-speed-photon bond substance return nuclear-star.**

**Earth age is about 4.6 billion years. Distance between earth and milky way center is about 27700 lightyears. Galactic disk radius is about 50000 lightyears. Which projected galactic disk shrinkage speed is about 4847.83 lightyears / billion years.**

**So, galactic disk edge the micro-speed-photon bond substance loop cycle is about 10.314 billion years.**

### **4. Epilogue**

**Nuclear-star center super high temperature so any substance fissile become photons, and towards all directions jet out photons. Photon side sideswiped make it deceleration becomes low-speed-photon, micro-speed-photon. Magnetic force make micro-speed-photon bond into positive or negative electrons, atoms, molecules, cosmic dust, planets, stars. Micro-speed-photon bond substance's distribution into spherical, radius up to hundreds thousands lightyears.**

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