Energy release mechanism of white hole and accurate calculation of solar system orbit

Zhi Cheng

(Baiyun District, Guangzhou, China. gzchengzhi@hotmail.com)

Abstract: The white hole hypothesis can explain various problems faced by spiral galaxies more than the black hole hypothesis. At present, the main problems still focus on the theoretical model of white holes. White hole solutions can also be obtained from general relativity. However, negative time must be used, and this article demonstrates very briefly that time inversion does not exist through the example of returning to youth age. This problem can be solved very well using virtual space-time physics. Under the framework of virtual space-time physics, a white hole model can be constructed without time inversion. In this paper, a white hole model is used for numerical calculations to obtain the trajectory of the solar system from the center of the Milky Way to the periphery of the Milky Way. Comparing the calculation results with the actual patterns of the Milky Way, it can be seen that the calculation results coincide well with the actual patterns. The calculation results show that the solar system orbit is an expanding elliptical spiral orbit. There is a clear demarcation point between the orbits in the center of the Milky Way and the orbits around the galaxy. This may be the reason for the bulge structure in the center of the Milky Way. The solar system has been in the center of the Milky Way for about 2.8 billion years. So far, the solar system has been running for about 1.8 billion years outside the center of the Milky Way, and about 600 to 700 million years have been far from the center of the Milky Way. This is basically consistent with the evolution of life on Earth.

Keywords: Black hole; White hole; Galactic Center

1 Introduction

A few days ago, I tried to analyze the hypothesis that the center of the Milky Way is a white hole [1,2]. Although some errors occurred in the analysis process, it can still explain some problems of the spiral galaxy. Including the formation of spiral structures, the evolution of life on Earth, and so on.

General relativity successfully predicted black holes and was confirmed in a series of high-precision experiments in recent years. The dynamic mechanism of black holes is relatively simple. In general, due to the huge mass of black holes, black holes can absorb masses and even energy forms such as photons. Of course, the general theory of relativity also predicts a "white hole", but the assumption that time can back off needs to be discussed, which has led to the white hole of general theory of relativity not being widely recognized. From the perspective of the dynamic mechanism, contrary to black holes, white holes will continuously eject mass and release a lot of energy at the same time. However, such a dynamic mechanism is based on the continuous regression of time. Intuitively, if there is a process of time inversion, in the process of continuous regression, the "black hole" will continuously eject the mass and form a so-called "white hole". One of the biggest problems is that the entropy of the material system around the entire white hole is constantly decreasing. However, we have not discovered such a law. This also makes the white hole of general relativity still in a mathematical derivation process.

However, if we look at the theory of virtual space-time physics [3] and use virtual space-time physics to deal with the white hole problem, there will not be a paradox of time inversion. Considering two different space-times, even when observing a closed material system in the same space-time, there is a phenomenon of increasing entropy. But if one observes another space-time from one space-time, it will be found that the entropy of another space-time can be continuously reduced. This solves the problem of entropy reduction in white holes. Of course, there is no such logical paradox as "returning to youth age".

I have noticed on the Internet that there is a discussion of that the Galactic Center (GC) is a white hole [4]. From the discussion, the opinions of opponents are mainly focused on mathematical models. According to the general theory of relativity, the existence of time inversion of white holes is unacceptable. The analysis in this article also proves that there is a logical contradiction in this time inversion. It can also be seen from this that if the center of the Milky Way is a white hole, it can indeed be used to explain many phenomena that were difficult to explain in the past, including galaxy rotation curves and dark matter problems. Therefore, if the theory of white holes can be modified to solve the time inversion paradox, the white hole hypothesis will be the most effective method to solve the spiral galaxy problems. Virtual space-time physics gives us such hope.

I analyzed the orbit of the solar system outside the center of the Milky Way a few days ago [1]. However, there is a key error in the calculation. After the amendment, the conclusion has not changed, that is, the solar system has been moving far from the center of the Milky Way for about 600 million years. And this period is the most active period in the evolution of life on Earth, including the prosperity of fish and dinosaurs. This should be caused by the fact that the earth is less affected by white holes in these orbits.

2 White hole dynamics

2.1 Time inversion problems

It is easier to understand black holes. If a black hole appears in real space time, external matter, including photons, will be attracted into the black hole. So, the black hole looks dark on the surface. However, as matter falls into a black hole, accompanied by the accelerated movement of charged particles, and then strong X-rays are emitted, it can be used to determine the existence of a black hole.

If you understand from the physics of virtual space-time, a mass falling into a black hole means that you have entered virtual space-time. Become a mass of virtual space time. In the process of real space time mass falling into a black hole, it will be accelerated by the gravitational force of the black hole, naturally bringing a lot of energy into the virtual space-time.

Then when we look at this real space time black hole, we will find that its dynamic process is opposite to the black hole in virtual space time from the real space time reference system. Therefore, a black hole in real space time corresponds to a white hole in virtual space time.

In the same way, a black hole in the virtual space-time corresponds to a real space time white hole.

At present, we have a certain degree of knowledge about the dynamic mechanism of black holes. The white hole is exactly the opposite process of the black hole, so in general relativity, we only need to add a negative sign in front of time, and all the dynamic equations of the black hole can be applied to the calculation of the white hole.

But the time of continuous retrogression is quite puzzling. Because this means that a person can continue to become younger and younger from old age, which is the so-called "return to youth age" "or return to child". When biotechnology hasn't made enough powerful progress, it is really incredible that the function of renew one's youth can be obtained only by the transformation of time and space. It is also difficult to find scientific evidence. After all, a person is really getting younger and younger. Does his thinking process gradually lose his memories of old age? If he can't forget the memories of his old age in the process of returning to youth age, then the entropy is still increasing. This is in contradiction with the rollback of time. If his memory does continue to be lost in the process of returning to youth age, the cognitive process of that person is completely meaningless, because although he looks younger and younger, he has no cognitive initiative at all presence. It's like playing a video upside down. Is this kind of rejuvenation and rebirth the expectation of many of us? Therefore, from this point of logic, the phenomenon of time retrogression should not occur.

If the above view is correct, this also means that in real space time, white holes in general relativity cannot exist. Otherwise, if the GC is a white hole, the galaxies near the GC should become younger and younger. If there is life on one of these planets, all life will continue to become younger and younger. So, the inverse growth is nonsense.

2.2 White holes in virtual space-time physics

Of course, if we understand from virtual space-time physics, this problem of time reversal will not occur. A white hole in real space time is a singularity that constantly releases a lot of mass and energy. When all of the mass and energy in the white hole are released, the white hole disappears. The black hole corresponding to the virtual space-time disappeared. The energy conversion process between real space time and virtual space-time is completed.

First consider the Schwarzschild radius：

$$R_s = \frac{GM}{c^2}$$

When the mass of an area is large enough and its distribution range reaches the Schwarzschild radius, then this part of the mass becomes invisible in real space time. Therefore, the Schwarzschild radius can be regarded as the dividing point between real space time and virtual space-time. Although the black hole is not visible in real space time, the mass of the black hole still exists. Because mass and energy can be converted to each other through the mass-energy relationship, energy is always conserved.

According to the perspective of virtual space-time physics, using a single space-time as the reference system (such as real space time as the reference system), in structure, there is a reciprocal relationship between the radius of white and black holes. Let the radius of the black hole be R_b and the corresponding radius of the white hole be R_w, then the two satisfy the following relationship:

$$R_b R_w = {l_p}^2$$

In other words, the larger the radius of the black hole, the smaller the radius of the white hole.

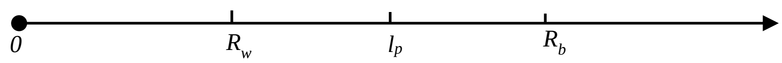

Figure 1. The relationship between the radius of corresponding black and white hole (Real spacetime reference)

But this is to understand the size of the white hole from a space-time. We can also simply transform the formula:

$$\frac{R_b}{l_p} = \frac{l_p}{R_w} = R$$

If R is a dimensionless radius, R_b/l_p is the radius of a real space time black hole, and l_p/R_w is the radius of a virtual space time white hole, it can be seen that they are equal. The advantage of using a dimensionless radius is that whether it is real space time or virtual space-time, the length can be expressed in a uniform way. And the physical laws of real space time can be directly applied to virtual space-time without form transformation.

In this way, Figure 1 can be transformed into:

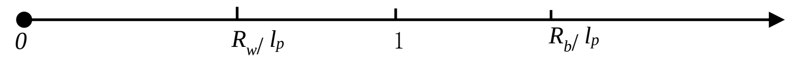

Figure 2. The relationship between the radius of corresponding black and white hole (Real spacetime reference)

From the perspective of virtual space-time, since the dimensionless length of virtual space-time is the inverse relationship of the dimensionless length of real space time, then Figure 2 will become:

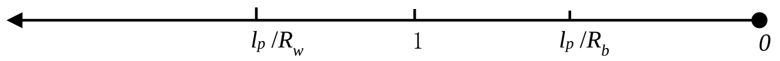

Figure 3. The relationship between the radius of corresponding black and white hole (Virtual spacetime reference)

Figure 3 shows the relationship between the corresponding white and black hole radii from a virtual space-time reference frame. This is completely consistent with the relationship of Figure 2 and Figure 1. Therefore, whether it is a white hole or a black hole, except for the difference in absorption and ejection of mass and energy, other properties are completely consistent.

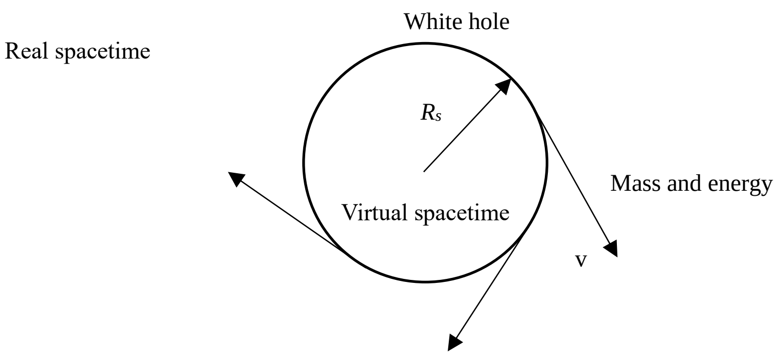

Figure 4. White hole and mass ejection

Figure 4 shows a white hole in real space time. Its radius is the Schwarzschild radius. First, the white hole is in the process of rapid rotation. This is due to the spin of the black hole generated by more and more energy absorbed by the corresponding black hole in the virtual space-time. Therefore, the higher the energy of the white hole, the faster the rotation speed. In addition, in real space time, the white hole will continuously eject mass and energy. Because the black hole corresponding to the virtual space-time absorbs a large amount of mass, it also absorbs a large amount of energy such as photons. Therefore, while the white hole continuously ejects mass, a large amount of energies will also be ejected. These energies will be ejected. The mass formation accelerates the effect. Therefore, the mass around the white hole is in a state of constant acceleration. If part of the mass absorbs enough energy, it can escape from the gravitational effect formed by the masses gathered around the white hole and gradually move away from the white hole to form a galaxy spiral structure.

3 Calculation of solar system orbits

3.1 Calculation of centered force field orbit

Because the mass of the white hole is huge, although the mass of the galaxy is ejected out of the white hole, it will still be elliptical around the white hole due to its attraction. Of course, a small part of the mass with very large energy can successfully escape the attraction of the mass of the white hole at one time, and directly away from the center of the galaxy.

At the center of the galaxy, all masses are relatively close to the white hole, so a centered force field can be used to calculate the orbit of the ejected mass.

According to the results of gravitational calculations, there are three motion modes of these projected masses, which are elliptical orbit, parabolic orbit and hyperbolic orbit. The specific calculation process has corresponding cases in many classic mechanics tutorials. Here we choose one of the calculation results [5]. Its orbital equation is:

$$r = \frac{1}{C(1 + \epsilon cos\theta)}$$

Where

$$C = \frac{m\alpha}{J^2}$$

$$\epsilon = \sqrt{1 + \frac{2J^2E}{m\alpha^2}}$$

$$\alpha = GMm$$

$$J = mr^2\omega$$

$$E = \frac{1}{2}mv^2 - \frac{\alpha}{r}$$

The parameter ϵ determines the trajectory of the galaxy. If $\epsilon = 1$, the trajectory is parabolic. If $0 < \epsilon < 1$, the orbit is elliptical. If $\epsilon > 1$, the orbit is hyperbola.

So, to satisfy elliptical motion, you need

$$-1 < \frac{2J^2E}{m\alpha^2} < 0$$

That is

$$E = \frac{1}{2}mv^2 - \frac{\alpha}{r} < 0 \qquad (1)$$

And

$$\frac{1}{2}mv^2 - \frac{\alpha}{r} > -\frac{m\alpha^2}{2J^2} \qquad (2)$$

Formula (2) means that the solar system will fall directly to the GC. Considering that we are studying here the ejection mass of white holes. So, all masses can be ejected directly. However, most of the masses meet the requirements of formula (1). This is because the mass ejected from the white hole in the center of the Milky Way is very large, so the gravitational potential energy generated is also very large, which leads to formula (1) being easily satisfied.

However, since the white hole is still continuously ejecting energy forms such as photons, when these photons are absorbed by the mass doing elliptical motion outside, it will cause the kinetic energy to continue to increase, which in turn will cause the velocity v to continue to increase. Therefore, the mass of the elliptical motion at the center of the Milky Way is constantly expanding. When the velocity v is large enough, these masses will be thrown out of the center of the galaxy.

Calculations for different orbital periods can be performed using Kepler's third law.

which is:

$$T = \sqrt{\frac{4\pi^2 a^3}{GM}}$$

Where a is half the length of the long axis of the ellipse.

Once the strips of the Milky Way's center are thrown out, the gravitational potential energy of the Milky Way's center will further decrease, which results in that formulas (1) and (2) cannot be satisfied, so the galaxy will do parabolic motion or hyperbolic motion.

3.2 Orbit of the solar system at the center of the Milky Way

When the solar system moves at the center of the Milky Way and satisfies the formulas (1) and (2), the solar system performs elliptical motion. But because the solar system can continuously absorb energy from white holes, the speed of the solar system will continue to accelerate. As a result, the radius of the ellipse is getting larger and larger. Figure 5 shows only elliptical orbits of 13 different periods. The outer orbit has greater energy.

In the calculation process, with a radius of 5000 light-years, the solar system takes v_s = 240km / s as the standard, so that the total angular momentum and total energy of the system can be obtained. Then according to the conservation of angular momentum and energy, the corresponding elliptical orbits can be calculated.

The energy released by the white hole in the center of the galaxy can accelerate the solar system. As a result of the acceleration, the speed changes. Therefore, you only need to multiply the speed of the solar system by a factor during the calculation. A coefficient less than 1 means that the solar system is moving inside the center of the Milky Way. Coefficients greater than 1 mean that the solar system moves around the Milky Way. In order to obtain the period value, the angular momentum in a single orbital period in the figure is not changed.

The speed coefficient of each track in the figure varies between 0.5 and 1.25.

The figure shows a circle at a radius of 5000 light years, marked with a red circle. At the same time, the radius is also a demarcation point, reflecting the difference between the center of the Milky Way and its outer orbit.

It can be seen from Figure 5 that the elliptical orbit in the red circle is different from the elliptical orbit outside the red circle. The elliptical tracks in the red circle are all tangent to the left, and the inner tracks are very dense. The elliptical orbits outside the red circle are all tangent to the right, and the outer orbits are very sparse. This is exactly the difference between the center of the Milky Way and the galaxies around it. Perhaps this can also explain why there is a high-brightness bulge in the center of the Milky Way. While the outer galaxies are flat, the mass density of the galaxies is small.

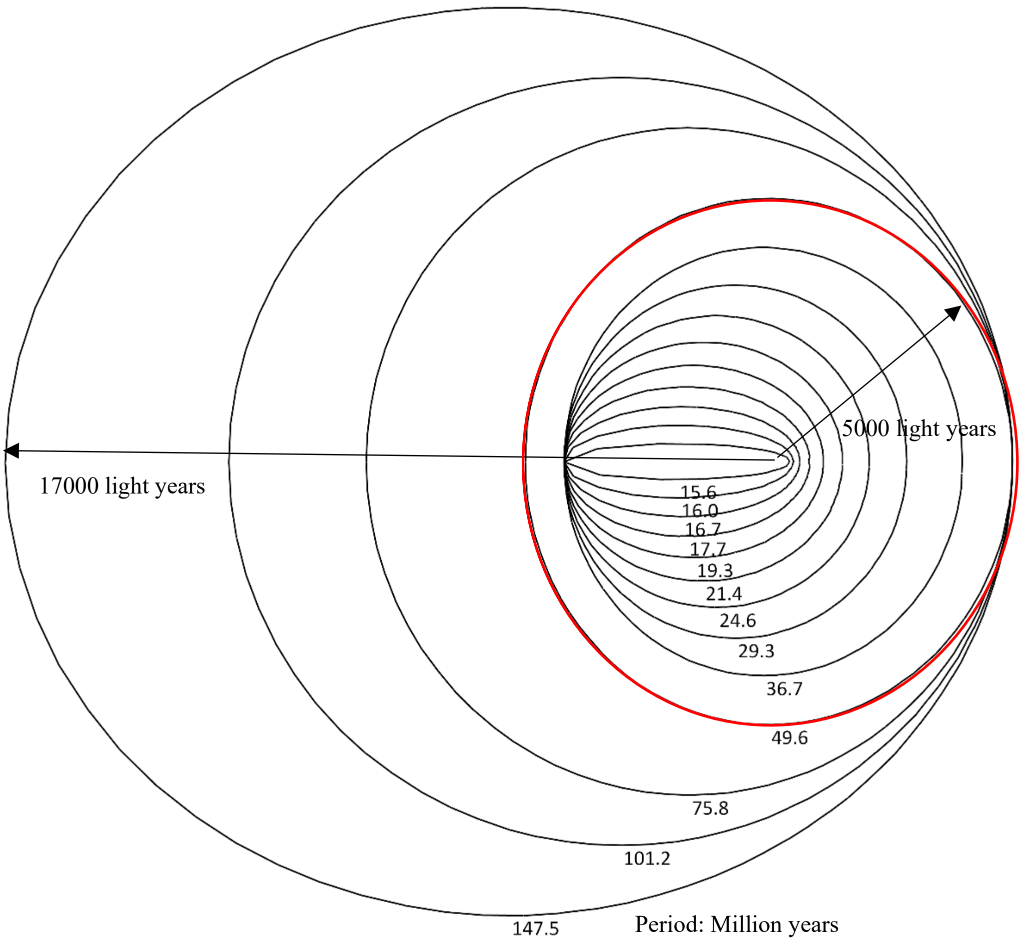

Figure 5. The orbits of solar system in Galactic Center

3.3 The orbit of the solar system outside the Milky Way bulge structure

Now consider the continuous energy delivery from the white hole in the galaxy's center to the solar system. So, at any moment, the solar system will get the energy input from the white hole. Here, the speed increase ratio is selected to be two ten thousandths, that is, the speed coefficient is set to 1.0002. Or expressed as $v_s' = 1.0002v_s$. In this way, an elliptical spiral orbit that is continuous from the inside to the outside can be obtained. As shown in Figure 6.

It is also assumed that outside the center of the Milky Way, the solar system can also continuously obtain the energy radiated from the center of the Milky Way, which will cause its speed to change, and then to angular momentum. The results of the simulation are shown in Figure 6. Figure 6 looks as if multiple closed ellipses with different shaft diameters are superimposed. It's actually a spiral that expands outward. But when the solar system orbit outside the red circle moves to the rightmost position in the picture, the orbit will move one-layer outward. The inner track of the red circle is centered on the far left of the red circle.

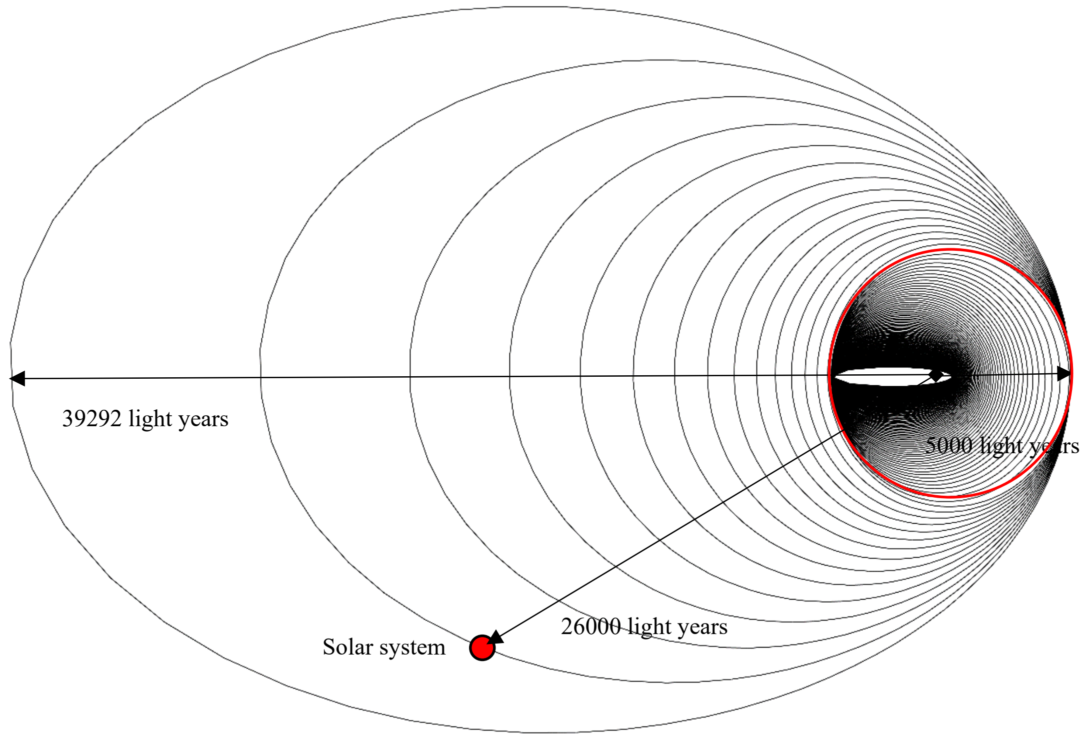

Figure 6. Major orbits of the solar system

Figure 6 shows the major orbits of the solar system after ejecting from a white hole in the center of the Milky Way. For ease of marking, the innermost track is not completely drawn. Therefore, the internal display is blank.

The total time required for the orbital movement drawn by the computer is 4,038 million years. Therefore, according to the life of the sun, the orbital motion time not drawn in the innermost layer is about 600 to 800 million years.

The red circle in the figure marks the range of the central bulge of the Milky Way with a radius of about 5000 light years. It can be seen from Figure 6 that this part is a demarcation point. That is, inside the Milky Way central bulge, the orbit of the solar system is shifted to the right. Once ejected from the bulge in the center of the Milky Way, the solar system's orbit gradually changes from circular to elliptical. And the elliptical track extends to the left. Elliptical orbits have also become sparser.

The calculation results show that the inner circle of the red circle, the central bulge of the Milky Way, the orbital time of the solar system is 2.2 billion years, plus the undrawn orbital time of 600 to 800 million years, so it can be calculated that solar system in this part has moved for about 2.8 to 3 billion years. In this way, it can be estimated that the solar system has been in moving for about 1.8 billion years since it broke away from the central bulge of the Milky Way.

According to the results calculated by the program, the long axis of the outermost elliptical orbit in Fig. 6 is 39392 light years. If the current position of the solar system in the Milky Way is considered, the solar system should now be on the outer ellipse orbit. Approximately the red dot in the figure.

Of course, the calculation process in Fig. 6 assumes that the energy obtained by the solar system from white hole radiation is always the same. This will cause some errors in the calculation results. The reason is that as the solar system moves farther away from the white hole in the center of the Milky Way, the solar system will get less and less radiant energy. Therefore, the spiral around the red circle in Figure 6 will be denser. As for the possible impact, it is worth further research.

4 Superposition of calculation results with actual graphics of the Milky Way

We can also overlay the calculation results with the actual graphics. Although this is not a real picture of the Milky Way, some important parameters are still highly referable.

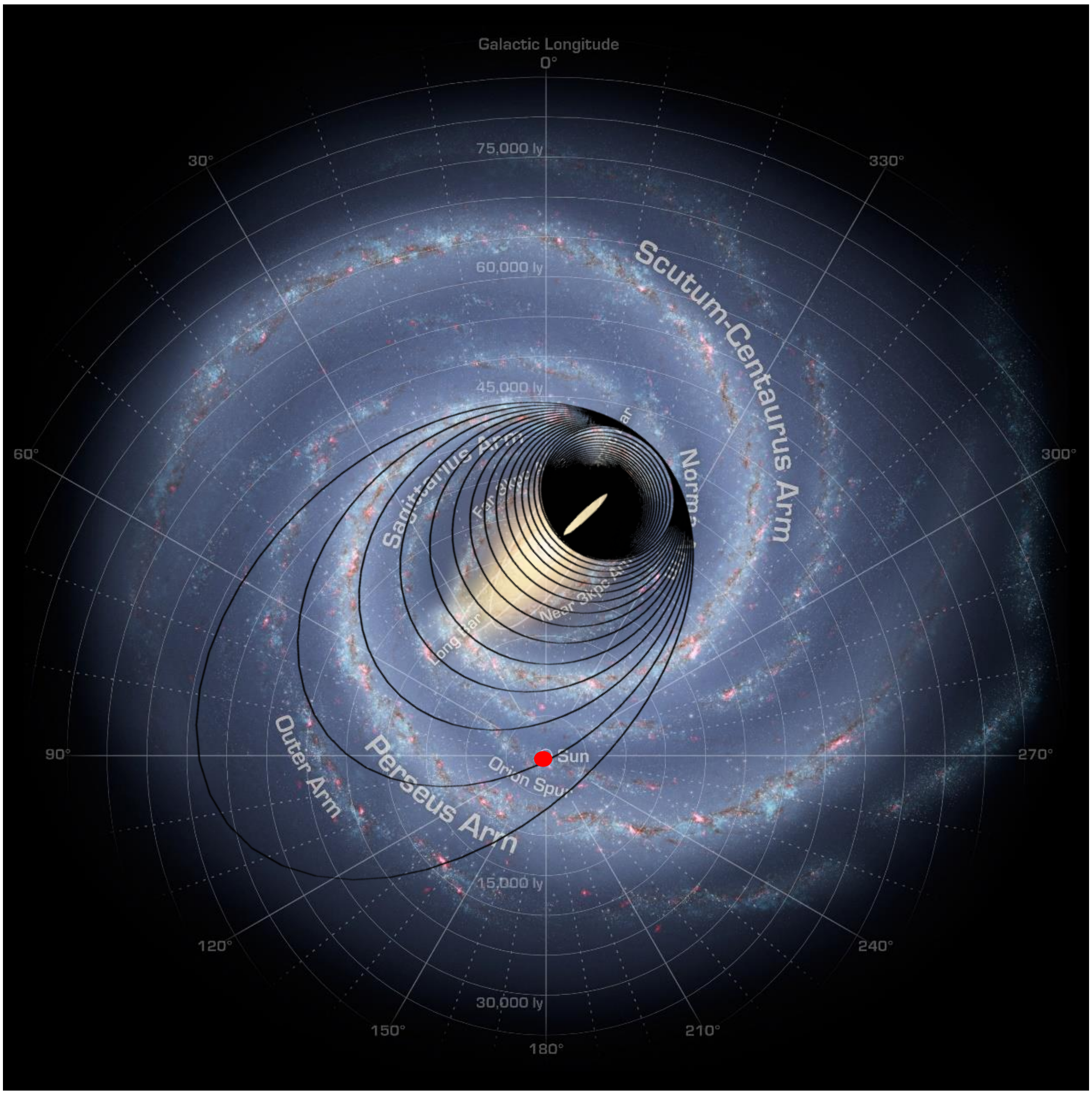

Figure 7. Superposition of calculation results with actual graphics of the Milky Way

The calculation result in FIG. 7 is proportionally scaled, so that a distance parameter that is consistent with the actual pattern can be obtained. The calculation results shown in the figure are superimposed with the actual Milky Way graphics, which can help us to see more clearly the orbital movement of the white hole after ejecting from the solar system. The red dot in the picture is where the solar system is located.

The calculation results in the figure show that the orbital dense area of the center position and the central stripe structure of the Milky Way are basically coincident. Of course, the calculation results only cover half of the strip structure. Judging from the shape of the spiral arm of the mass ejected from the white hole in the center of the galaxy, it is believed that the position of the mass ejected from the center of the galaxy has two symmetrical points. In the same way, the other half of the strip structure can be calculated, and then superimposed on it to obtain a complete strip structure.

5 Declining mass of the Milky Way's center

Of course, if this article assumes that the white hole in the GC will continuously accelerate the solar system. If this assumption is not true, you can also consider that after the white hole continuously ejects its mass, its own mass will continue to decrease. This will appear:

$$M' = M - \Delta M$$

Since in the orbit calculation formula

$$\frac{\alpha}{J} = \frac{GM}{mr^2 v}$$

The mass *M* and the speed *v* change in proportion. The increase in velocity is therefore consistent with the effect of reducing the mass *M* in the GC. Therefore, the calculation result does not change. It will not be recalculated here.

Of course, it is also possible that both the decrease in the mass of the GC and the increase in the speed of the solar system exist. It is only inside the GC that the white hole radiates energy and causes the solar system to be continuously accelerated. Outside the GC, it is mainly the effect of the decreasing mass of white holes in the GC. This may solve the reason for the spiral motion that can continue to spread after the solar system is far away from the GC.

6 Conclusion

In the 1970s, the white hole theory has gained the attention of academia. However, due to various theoretical and practical difficulties, the discussion of white holes has become less and less in recent years. In terms of theory, the theory currently used to discuss white holes is mainly general relativity. In general relativity, a white hole can be simply understood as a time inversion of a black hole. The white hole is understood as the reverse process of the black hole. The fatal flaw in this understanding is that the entropy of the white hole needs to be continuously reduced. This violates the currently known physical laws. Therefore, white holes currently exist in various science fiction literature. In terms of time observation, due to the lack of relevant observational evidence, there are still big doubts about whether there are many people in white holes. After all, direct evidence about black holes is very scarce. Nevertheless, some researchers have proposed some important evidence that white holes may exist in the universe at present, which deserves our attention.

There are many advantages to using white holes to explain the structure of the Milky Way. After all, if we understand the spiral structure of the Milky Way from the assumption that the center of the

Milky Way is a huge black hole, there are many unexplainable phenomena, including a large amount of antimatter radiation in the center of the Milky Way, the generation of a large number of galaxies, and extremely high brightness. Uplift structure, etc. If we understand from the assumption of white holes, the above problems will become more reasonable.

In order to provide more evidence that the center of the galaxy is a white hole, this paper uses some known data to perform calculations. It is found that at a position with a radius of about 5000 light years, the center of the galaxy can form a circular structure different from the outer orbit. of. If we consider the mass projected by the white hole to do elliptical motion, we can explain the high-brightness strip structure in the center of the Milky Way.

Considering the high-speed rotation of the white hole in the center of the Milky Way, the spiral movement of these outward masses made by the projected masses can form the spiral arm structure unique to spiral galaxies we now observe. It's like the spiral-shaped sparks produced by a rotating firework.

Comparing the calculated spiral trajectory of the solar system with the actual pattern of the Milky Way, we can find that the two can better coincide. This also provides better support for the white hole model.

The calculation results also show that the solar orbit in the galactic uplift part lasted about 2.8 billion years. In contrast to the evolutionary process of the earth's biology, it can be found that during the three billion years after the birth of the earth, the temperature of the earth's surface was very high. It was only about two billion years before the emergence of single-celled organisms. It shows that during this time, the earth's environment is not suitable for the growth and evolution of higher organisms. After the solar system broke away from the central bulge of the Milky Way, it has been in operation for about 1.8 billion years. During this period, the solar system has been operating near the uplift for about one billion years, so the environment is not particularly good. In contrast to the evolutionary process of the earth's biology, there were only simple creatures on the earth before 3.8 billion years ago. This is basically consistent with the calculation results. But four billion years later, the solar system is far away from the white hole in the center of the Milky Way. At this time, the energy radiated by the white hole in the solar system has been reduced a lot. At this time, the environment on the earth has become more suitable for the evolution of living things. So after this, the evolution of higher organisms such as fish, dinosaurs, and humans appeared on Earth.

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Publishing

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Appendix: Computer programs（Excel VBA）

Parameters

vs	2.40E+05	The initial velocity of solar in 5000 l.y. distance.	1
			2
m	2.00E+30	Solar's mass	3
			4
			5
			6
G	6.67E-11	Gravitational constant	7
DD	1.00E+16	Convert 1 l.y. to seconds	8
Epsi	0.805394		9
xmin	636	The min value of x-axis po sition	10
xmax	5555		11
T	408.4501	Period of orbits, in Million years	12
ymin	3413		13
ymax	6526		14
DtM	3.10E+13	Convert Million years to seconds	15
Distance	27141.19	The distance between Solar and GC (light year)	16
Time			17
Rmax	39291.93	The max Radius of orbit	18

Ttime	4038.283	Total time of spiral orbit. In Million years	19
Ttimeinner	2195.965	Total time of inner orbit of GC bugle	20

Programs

```
Sub OrbitsSamples() ‘Calculate some orbits of solar system
Dim C, Epsi, Alpha, J, E, m, r, Omiga, G, Mc, v, x, y, DD, vs, Thita, T, DtM
Set Shp = Worksheets(3)

DtM = Sheet1.Cells(15, 2)
DD = Sheet1.Cells(8, 2)
G = Sheet1.Cells(7, 2) 'grativity constant
m = Sheet1.Cells(3, 2) 'Solar's mass
vs = Sheet1.Cells(1, 2) 'Solar's orbit velocity
Mc = 200 * 10 ^ 8 * m 'Galactic Center's mass

For ii = 9 To 5 Step -1
    vs = vs * ii * 0.1
    r = 5000 * DD
    Alpha = G * Mc * m
    J = m * 5000 * DD * vs
    E = 0.5 * m * vs ^ 2 - Alpha / r
    sqroot = 1 + 2 * J ^ 2 * E / (m * Alpha ^ 2)
    If sqroot < 0 Then
        GoTo Endprogram
    End If
    Epsi = Sqr(1 + 2 * J ^ 2 * E / (m * Alpha ^ 2))
    Sheet1.Cells(9, 2) = Epsi
    For i = 1 To 101
        Thita = 3.14 * 0.02 * i
        J = J * 1
        v = J / (m * r)
        C = (m * Alpha / J ^ 2)
        r = 1 / (C * (1 + Epsi * Cos(Thita)))
        Sheet1.Cells(i, 4) = v
        Sheet1.Cells(i, 5) = Thita
        Sheet1.Cells(i, 6) = r / DD
        x = 4000 + Int(r * Cos(Thita) / DD / 9)
        y = 4000 + Int(r * Sin(Thita) / DD / 9)
        Sheet1.Cells(i, 7) = x
```

```
            Sheet1.Cells(i, 8) = y

            If i = 1 Then
                beginX = x
                beginY = y
            End If
            endX = x
            endY = y
            With Shp.Shapes.AddLine(beginX, beginY, endX, endY).Line
                .Weight = 4
                .DashStyle = msoLineSolid
                .ForeColor.RGB = RGB(0, 0, 0)
                If i = 120 Or i = 150 Then 'Solar system location
                    .Weight = 20
                    .ForeColor.RGB = RGB(255, 0, 0)
                End If
            End With

            beginX = endX
            beginY = endY


        Next
        xmin = Sheet1.Cells(10, 2)
        xmax = Sheet1.Cells(11, 2)
        ymin = Sheet1.Cells(13, 2)
        ymax = Sheet1.Cells(14, 2)
        a = (xmax - xmin) * 9 * DD / 2
        T = Sqr(4 * 3.14 ^ 2 * a ^ 3 / (G * Mc)) / DtM
        Sheet1.Cells(12, 2) = T
        With Shp.Shapes.AddShape(msoShapeRectangle, xmin + Int((xmax - xmin) / 2), ymax, 200,
100)
            .Name = "Note bar"
            .Fill.ForeColor.RGB = RGB(255, 255, 255)
            .Fill.Transparency = 1
            .Line.Visible = 0
            .TextFrame.Characters.Text = Format(T, "0.0")
            .TextFrame.Characters.Font.Size = 50
            .TextFrame.Characters.Font.ColorIndex = 1
            .TextFrame.MarginTop = 0
            .TextFrame.MarginBottom = 0
        End With
Endprogram:
Next ii
```

```
End Sub

Sub SpiralObits() ‘Calculate the continuously spiral orbits of solar system
Dim C, Epsi, Alpha, J, E, m, r, Omiga, G, Mc, v, x, y, DD, vs, Thita, T, DtM, Delt, TTime, TTimein
Set Shp = Worksheets(3)

DtM = Sheet1.Cells(15, 2)
DD = Sheet1.Cells(8, 2)
G = Sheet1.Cells(7, 2) 'grativity constant
m = Sheet1.Cells(3, 2) 'Solar's mass
vs = Sheet1.Cells(1, 2) * 0.1 'Solar's orbit velocity
Mc = 200 * 10 ^ 8 * m 'Galactic Center's mass
Delt = 3E+52

For i = 1 To 12800
    vs = vs * 1.0002
    r0 = 5000 * DD
    Alpha = G * Mc * m
    J = m * 5000 * DD * vs
    E = 0.5 * m * vs ^ 2 - Alpha / r0
    sqroot = 1 + 2 * J ^ 2 * E / (m * Alpha ^ 2)
    If sqroot < 0 Then
        GoTo Endprogram
    End If
    Epsi = Sqr(1 + 2 * J ^ 2 * E / (m * Alpha ^ 2))
    Sheet1.Cells(9, 2) = Epsi
    Thita = 3.14 * 0.02 * i
    C = (m * Alpha / J ^ 2)
    r = 1 / (C * (1 + Epsi * Cos(Thita)))
    Omiga = J / (m * r ^ 2)
    v = r * Omiga
    TTime = TTime + 3.14 * 0.02 / Omiga
    If r < 5000 * DD Then
        TTimein = TTime
    End If

    Sheet1.Cells(i, 4) = v
    Sheet1.Cells(i, 5) = Thita
    Sheet1.Cells(i, 6) = r / DD
    x = 5000 + Int(r * Cos(Thita) / DD / 9)
    y = 5000 + Int(r * Sin(Thita) / DD / 9)
    Sheet1.Cells(i, 7) = x
    Sheet1.Cells(i, 8) = y
```

```
        If i = 1 Then
            beginX = x
            beginY = y
        End If
        endX = x
        endY = y
        With Shp.Shapes.AddLine(beginX, beginY, endX, endY).Line
            .Weight = 4
            .DashStyle = msoLineSolid
            .ForeColor.RGB = RGB(0, 0, 0)
        End With

        beginX = endX
        beginY = endY


    Next
    xmin = Sheet1.Cells(10, 2)
    xmax = Sheet1.Cells(11, 2)
    ymin = Sheet1.Cells(13, 2)
    ymax = Sheet1.Cells(14, 2)
    a = (xmax - xmin) * 9 * DD / 2
    T = Sqr(4 * 3.14 ^ 2 * a ^ 3 / (G * Mc)) / DtM
    Sheet1.Cells(12, 2) = T
    Sheet1.Cells(19, 2) = TTime / DtM
    Sheet1.Cells(20, 2) = TTimein / DtM
    Endprogram:

    End Sub
```

白洞的能量释放机制及太阳系轨道的精确计算

程智

（广州市白云区，gzchengzhi@hotmail.com）

摘要：白洞假设比黑洞假设更能够解释螺旋星系面临的各种问题。目前主要问题还是集中在白洞理论模型方面。从广义相对论中也可以获得白洞解。不过必须使用负时间，本文通过返老返童的例子非常简洁地论证了时间反演是不存在的。用虚时空物理学能够很好地解决这个问题。在虚时空物理学框架下，不需要时间反演即可构造白洞模型。本文利用白洞模型进行了数值计算，获得了太阳系从银河系中心到银河系外围的运动轨迹。并将计算结果与银河系实际的图案进行对比，可以看出，计算结果与实际图案重合的还是比较好的。计算结果表明，太阳系轨道是一个不断扩大的椭圆螺旋形状轨道。在银河系中心和银河系外围的轨道之间有着明显的分界点。这可能是银河系中心存在隆起结构的原因。而太阳系在银河系中心运行的时间大约为 28 亿年，到目前为止，太阳系在银河系中心隆起外部运行时间大约为 18 亿年，大约有六到七亿年是在远离银河系中心位置运行的。这跟地球上生命进化时间基本符合。

关键词：黑洞；白洞；

Аннотация: Гипотеза о белой дыре может объяснить различные проблемы, с которыми сталкиваются спиральные галактики, больше, чем гипотеза о черной дыре. В настоящее время основные проблемы все еще сосредоточены на теоретической модели белых дыр. Решения для белых дыр также могут быть получены из общей теории относительности. необходимо использовать отрицательное время, и эта статья очень кратко демонстрирует, что инверсия времени не существует на примере возвращения в юношеский возраст. Эта проблема может быть очень хорошо решена с помощью физики виртуального пространства-времени. В рамках физики виртуального пространства-времени модель белой дыры может быть построена без инверсии времени. В этой статье модель белой дыры используется для численных расчетов, чтобы получить траекторию солнечной системы от центра Млечного пути к периферии Млечного пути. Результаты расчетов с фактическими моделями Млечного Пути, можно увидеть, что результаты расчетов хорошо совпадают с фактическими моделями. Результаты расчетов показывают, что орбита солнечной системы представляет собой расширяющуюся эллиптическую спиральную орбиту. Между орбитами в центре Млечного пути и орбитами вокруг галактики существует четкая демаркационная точка. Это может быть причиной образования выпуклой структуры в центре Млечного пути. Солнечная система находится в центре Млечного пути около 2,8 миллиардов лет. До настоящего времени солнечная система работала около 1,8 миллиардов лет за пределами центра Млечного пути, и было от 600 до 700 миллионов лет. далеко от центра Млечного Пути. Это в основном соответствует эволюции жизни на Земле.

1 导言

前几天我尝试对银河系中心为白洞的假设进行了分析[1,2]，尽管分析过程出现了一些错误，

但还是能够很好地解释银河系的一些问题。包括螺旋结构的形成，地球生命的进化等。

广义相对论成功地预言了黑洞，并在近几年的一系列高精度实验中获得证实。黑洞的动力学机制相对来说比较简单。一般来说，由于黑洞的巨大质量，导致黑洞能够吸收质量以至于光子等能量形式。当然广义相对论也预言了“白洞”，不过需要引入时间能够回退的假设，这导致广义相对论的白洞并未被广泛认可。从动力学机制来看，与黑洞相反，白洞会不断抛射质量，同时释放大量能量。然而这样的一种动力学机制是建立在时间不断回退的过程中的。直观来看，就是如果存在时间反演的过程，则在不断回退的过程中，“黑洞”会不断抛射出质量出来，形成所谓的“白洞”。这其中存在的一个最大问题就是整个白洞周围的物质系统的熵是在不断减少的。然而这样的规律我们并未在发现过。这也使得广义相对论的白洞目前仍始终处于一种数学上的推导过程中。

然而如果我们从虚时空物理学的理论[3]来看，利用虚时空物理学来处理白洞问题，就不会出现时间反演的悖论。考虑到两个不同的时空，即便在任何时空中观察封闭的物质系统，都是存在熵不断增大的现象的。但如果从一个时空的观察系来观察另一个时空，就会发现另一个时空的熵是可以不断减少的。这就解决了白洞的熵减少问题。当然也就不存在所谓的“返老返童”等逻辑悖论。

我注意到网上有关银河系中心是白洞的讨论[4]，从讨论情况来看，反对者意见主要集中在数学模型上。按照广义相对论的观点，白洞存在时间反演，这是让人难以接受的。本文的分析也证明，这种时间反演存在逻辑上的矛盾。从这里也可以看出，如果银河系中心是白洞，确实可以用来解释很多过去难以解释的现象，包括行星旋转曲线，暗物质问题等。因此如果能够修改白洞的理论，解决时间反演悖论，白洞假设将是解决螺旋星系系列难题最有效的方法。虚时空物理学给了我们这样的希望。

我在前几天分析了太阳系在银河系中心外部运行的轨道情况[1]。不过其中的计算存在一个关键错误。修改之后结论并没有改变，即太阳系在远离银河系中心的位置运行了大约 6 亿年的时间。而这期间正是地球生命进化最活跃的时期，包括鱼类和恐龙等生物的繁荣。这应该与地球在这些轨道上受到白洞的影响比较小的原因而导致。

2 白洞的动力学机制

2.1 时间反演难题

对于黑洞比较容易理解。在实时空中如果出现了黑洞，则外部的物质，包括光子等都会被吸引进黑洞。因此黑洞表面上看起来是漆黑一片。不过由于在物质坠入黑洞的过程中，伴随着带电粒子的加速运行，进而会辐射出强烈的 X 射线，则可以被用来判断黑洞的存在。

如果从虚时空物理学来进行理解，质量坠入黑洞也就是意味着进入了虚时空。成为虚时空的质量。而在实时空中质量坠入黑洞过程中，会被黑洞的引力加速，自然也就将大量的能量带入了虚时空。

那么我们从虚时空来看这个实时空的黑洞，就会发现，它的动力学过程与实时空中的黑洞是

一个相反的过程，不断会有大量的物质和能量从实时空的黑洞中被抛射出来。因此实时空的黑洞对应的就是虚时空的白洞。

同理，虚时空的黑洞对应的就是实时空的白洞。

目前我们对黑洞的动力学机制已经有一定程度的知识。而白洞正好是黑洞的相反过程，因此在广义相对论中，我们只需要在时间前面加一个负号，所有黑洞的动力学方程都可以应用到白洞的计算中来。

不过不断倒退的时间是相当令人费解的。因为这意味着一个人可以从年老开始不断地变得越来越年轻，即所谓的"返老返童"。在生物技术没有获得足够强大的进展的时候，单靠时空的转换就获得这种返老返童的功能，确实是不可思议的。估计也很难找到科学的证据。毕竟一个人真的越来越年轻了，那他的思维过程，**他是不是也会逐渐丢失年老时候的记忆**？如果他在返老返童的过程中，**不能够忘记年老时候的记忆，则说明熵还是在不断增加的**。这就跟时间回退出现了矛盾。如果他的记忆确实会在返老返童的过程中不断出现丢失，那人的认知过程就完全没有了意义，因为他虽然看起来越来越年轻了，但是他完全没有认知的主动性存在。这就像是将一段录像倒过来播放一样。这样的返老返童是否就是我们很多人所期望的呢？因此从这一点逻辑上来看，也不应该出现时间倒退的现象。

如果上述看法是正确的，这也就意味着在实时空，广义相对论中的白洞是不能存在的。否则如果银河系中心是白洞，则在银河系中心附近的星系应该会变得越来越年轻，如果这些星系中的某个行星上面存在生命，则所有的生命都将是不断变得越来越年轻的逆生长的。

2.2 虚时空物理学中的白洞

当然我们如果从虚时空物理学来进行理解，则不会出现这种时间反转的问题。实时空中的白洞就是一个不断释放大量质量和能量的一个奇点。当白洞中的质量和能量释放完毕，则白洞消失。对应虚时空的黑洞也就消失了。完成了实时空和虚时空之间的能量转换过程。

首先考虑施瓦希半径：

$$R_s = \frac{GM}{c^2}$$

当一个区域的质量足够大，其分布范围达到了施瓦希半径的时候，这时候这部分质量在实时空中就变得不可见了。因此施瓦希半径可以看作是实时空和虚时空的分界点。虽然黑洞在实时空中并不可见，但是黑洞的质量仍然是存在的。因为质量与能量之间可以通过质能关系式来进行相互转换，因此能量还是始终保持守恒的。

按照虚时空物理学的观点，以单一时空为参照系（比如以实时空作为参照系），在结构上，白洞和黑洞半径之间是一个倒数关系。设黑洞的半径为 R_b，对应的白洞半径为 R_w，则二者满足下列关系：

$$R_b R_w = {l_p}^2$$

也就是说黑洞的半径越大，白洞的半径越小。

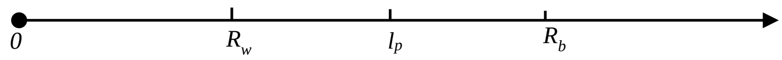

Figure 1. The relationship between the radius of corresponding black and white hole (Real spacetime reference)

不过这是从一个时空来理解白洞的尺寸。我们还可以简单变换一下该公式：

$$\frac{R_b}{l_p} = \frac{l_p}{R_w} = R$$

如果将 R 作为一个无量纲的半径，R_b/l_p 为实时空黑洞的半径，而 l_p/R_w 为虚时空白洞的半径，则可以看出二者是相等的。采用无量纲半径的好处在于无论是实时空还是虚时空，长度都可以用一种统一的方式来表示出来。且实时空的物理规律可以不需要进行形式变换就可以直接应用到虚时空中。

这样图 1 就可以变换成：

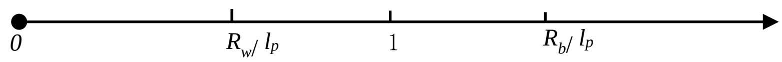

Figure 2. The relationship between the radius of corresponding black and white hole (Real spacetime reference)

而如果从虚时空来看，则由于虚时空的无量纲长度是实时空无量纲长度的倒数关系，则图 2 将变成：

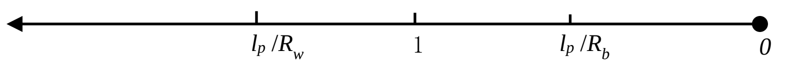

Figure 3. The relationship between the radius of corresponding black and white hole (Virtual spacetime reference)

图 3 显示了从虚时空参照系来看对应的白洞和黑洞半径之间的关系。这和图 2 和图 1 的关系是完全一致的。因此无论是白洞还是黑洞，除了对质量和能量是吸收还是抛射的不同之外，其他性质是完全一致的。

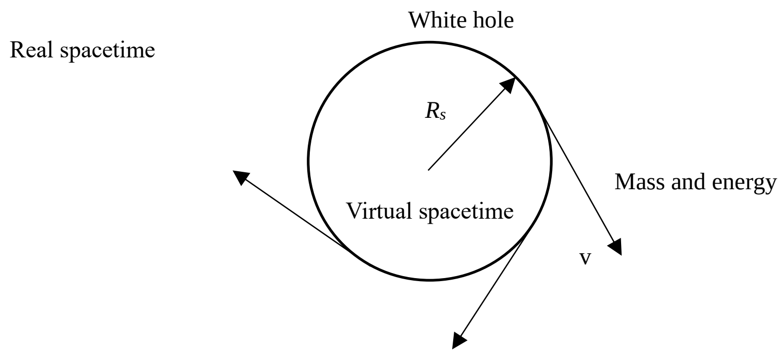

Figure 4. White hole and mass ejection

图 4 显示了实时空中的一个白洞。其半径为史瓦西半径。首先该白洞处于快速旋转过程之中。这是由于在虚时空对应的黑洞吸收的能量越来越多所产生的黑洞的自旋。在虚时空中对应的就是白洞的自旋。因此白洞的能量越高，旋转速度越快。另外在实时空，该白洞会不断向外抛射质量和能量。由于在虚时空对应的黑洞吸收了大量质量的同时，还吸收了大量的光子等能量，因此白洞不断抛射出质量的同时，也会有大量的能量被抛射出来，这些能量会对已经抛射出来的质量形成加速效应。故白洞周围的质量是处于一个不断被加速的状态。如果部分质量吸收了足够多的能量，就可以脱离白洞周围聚集的质量所形成的引力作用，逐渐远离白洞，形成星系螺旋结构。

3 太阳系轨道的计算

3.1 有心力场轨道的计算

由于白洞的质量巨大，因此尽管有星系质量被抛射出了白洞，但受到白洞巨大质量的吸引，仍将围绕白洞做椭圆运动。当然少部分能量非常大的质量能够一次性成功逃离白洞质量的吸引，直接远离银河系中心。

在银河系中心各种质量离白洞的距离都比较近，因此可以采用有心力场的方式来计算被抛出的质量所运行的轨道。

按照引力计算的结果，这些被抛射出来的质量有三种运动方式，分别是椭圆轨道、抛物线轨道和双曲线轨道。具体的计算过程在很多的经典力学教程中都有相应的案例，这里选择其中的一个计算结果[5]。其轨道方程为：

$$r = \frac{1}{C(1 + \epsilon cos\theta)}$$

其中

$$C = \frac{m\alpha}{J^2}$$

$$\epsilon = \sqrt{1 + \frac{2J^2E}{m\alpha^2}}$$

$$\alpha = GMm$$

$$J = mr^2\omega$$

$$E = \frac{1}{2}mv^2 - \frac{\alpha}{r}$$

其中的参数ϵ决定了星系的运动轨迹。如果$\epsilon = 1$，则该轨迹为抛物线。如果$0 < \epsilon < 1$，则轨道为椭圆。而如果$\epsilon > 1$，则轨道为双曲线。

因此要满足椭圆运动，需要：

$$-1 < \frac{2J^2E}{m\alpha^2} < 0$$

即：

$$E = \frac{1}{2}mv^2 - \frac{\alpha}{r} < 0 \qquad (1)$$

以及

$$\frac{1}{2}mv^2 - \frac{\alpha}{r} > -\frac{m\alpha^2}{2J^2} \qquad (2)$$

公式（2）意味着该星系将直接掉落银河系中心。考虑到我们这里研究的是白洞抛射质量。因此所有质量都是可以直接抛射出去的。但是大部分质量都满足公式（1）的要求，这是由于银河系中心白洞抛射出来的质量非常巨大，故所产生的引力势能也是非常大的，这导致公式（1）很容易被满足。

不过由于白洞还在不断抛射出光子等能量形式，当在外部做椭圆运动的质量吸收了这些光子之后，就会导致动能不断持续增加，进而使得速度 v 持续增加。因此在银河系中心做椭圆运动的质量，其椭圆轨道半径是在不断扩大的。当速度 v 足够大的时候，这些质量将被抛出银河系中心。

对于不同轨道周期的计算可以使用开普勒第三定律来进行。

即：

$$T = \sqrt{\frac{4\pi^2 a^3}{GM}}$$

其中 a 为椭圆长轴长度的一半。

一旦抛出了银河系中心条状区域之后, 银河系中心的引力势能将进一步下降, 这导致公式(1)和（2）都无法被满足，因此星系将做抛物运动或者双曲线运动。

3.2 太阳系在银河系中心的轨道

当太阳系位于银河系中心运动，满足公式(1)和(2)，此时太阳系做椭圆运动。但由于太阳系可以不断从白洞吸收能量, 因此太阳系的运动速度会不断加快。从而使得椭圆半径越来越大。图 5 只显示了其中 13 个不同周期的椭圆轨道。越外层的轨道其能量越大。

在计算过程中，以 5000 光年半径处，太阳系以 v_s=240km/s 为标准，这样可以获得系统的总角动量和总能量。然后按照角动量守恒和能量守恒定律就可以计算出对应的椭圆轨道。

银河系中心白洞释放的能量可以对太阳系进行加速。加速的结果导致太阳系运行的速度发生改变。因此只需要在计算过程中将太阳系的速度乘以一个系数即可。小于 1 的系数意味着太阳系在银河系中心内部运行。大于 1 的系数意味着太阳系在银河系外围运行。为了获得周期数值，图中单个轨道周期内角动量不变。

图中各轨道速度系数在 0.5 ~ 1.25 之间变化。

图中显示，半径 5000 光年处为圆形，用红色圆圈标记出来。同时该半径也是一个分界点，反映出银河系中心和银河系外围轨道的区别。

从图 5 中可以看出，红色圆圈中的椭圆轨道与红色圆圈外部的椭圆轨道有所区别。红色圆圈中的椭圆轨道全部相切于左边，内部的轨道非常稠密。而红色圆圈外部的椭圆轨道全部相切于右边，外部的轨道非常稀疏。这也正是反映出银河系中心与外围的星系轨道的区别。或许这也可以解释为何银河系中心存在一个高亮度巨大的隆起部位。而外部星系物质扁平，星系质量密度较小。

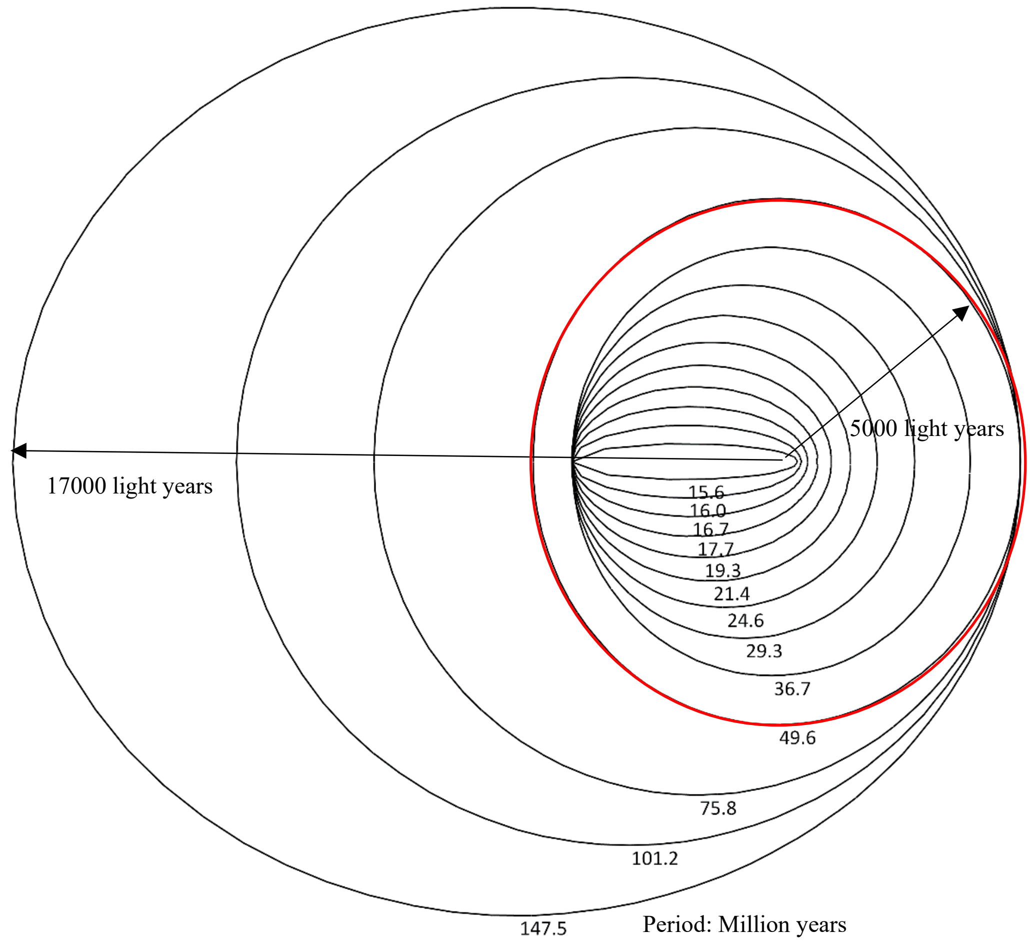

Figure 5. The orbits of solar system in Galactic Center

3.3 太阳系在银河系条状结构之外的轨道

现在考虑银河系中心白洞对太阳系的持续能量输送。这样任意时刻，太阳系都将获得白洞的能量输入。这里将速度增加比例选择万分之二，即速度系数定为 1.0002. 或者表示为$v_s{}' = 1.0002v_s$. 这样可以获得从内至外连续的椭圆螺旋轨道。如图 6 所示。

另外也假设在银河系中心隆起外部，太阳系也还可以持续获得银河系中心辐射的能量，则将引起其速度的改变，进而引起角动量的改变。模拟运算的结果如图 6 所示。图 6 看起来好像是多个不同轴径的封闭椭圆叠加在一起。实际上它是不断向外扩大的螺旋线。只是当红色圆圈外部太阳系轨道运行到了图中最右边的位置时，轨道会向外移动一层。红色圆圈内部轨道则是在集中在红色圆圈的最左边。

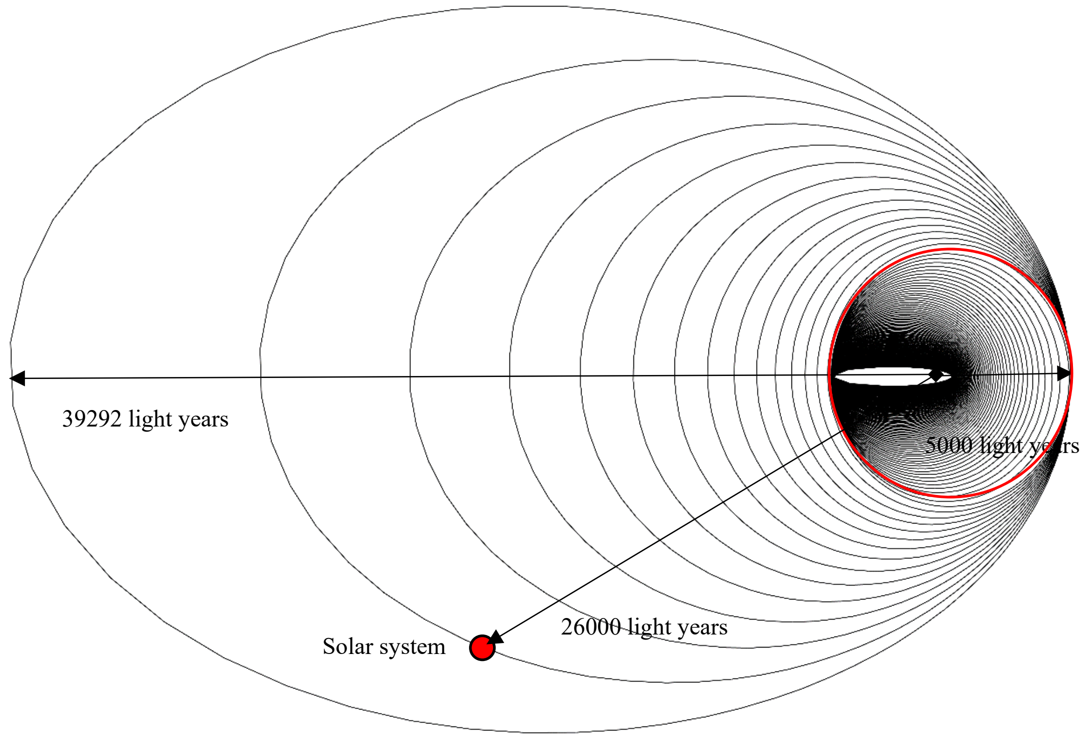

Figure 6. Major orbits of the solar system

图 6 显示了太阳系自银河系中心白洞抛射出来之后的主要轨道。为了便于标记，其中最内层的轨道没有完全绘制出来。故内部显示为空白。

计算机绘制出来的轨道运行需要的总时间为 40.38 亿年时间，因此按照太阳的寿命，最内层没有绘制出来的轨道运行的时间大约为 6~8 亿年。

图中红色圆圈标记了大约 5000 光年半径的银河系中心隆起部分的范围。从图 6 中可以看出该部分是一个分界点。即在银河系中心隆起内部，太阳系运行的轨道偏向右侧。而一旦抛射出了银河系中心的隆起，则太阳系轨道逐渐由圆形变回椭圆轨道。且椭圆轨道向左边延伸出去。椭圆轨道也变得更加稀疏。

计算结果显示，红色圆圈内层，银河系中心隆起部分，太阳系轨道运行的时间为 22 亿年时间，加上没有绘制出来的轨道运行的 6~8 亿年时间，因此可以计算出太阳系在银河系中心隆起部位运行的时间大约为 28~30 亿年。这样可以估算出太阳系脱离银河系中心隆起部分以后已经运行了大约 18 亿年时间。

按照程序计算的结果，图 6 中最外层的椭圆轨道长轴长度为 39392 光年，如果考虑目前太阳系在银河系中的位置，故太阳系目前应该是在由外至内的第二层椭圆轨道上面。大约在图中红点位置。

当然图 6 的计算过程中假设了太阳系获得白洞辐射的能量始终是不变的。这将会导致计算结果出现一些误差。原因在于随着太阳系远离银河系中心的白洞，太阳系所获得的白洞辐射能量将会越来越少。因此图 6 中红色圆圈外围的螺旋线会更密一些。至于其中可能产生的影

响值得进一步研究探讨。

4 计算结果与银河系实际图形的叠加

我们也可以将计算结果与实际图形叠加在一起。尽管这并不是银河系真实的照片，但是其中一些重要参数还是具备很强的可参考性的。

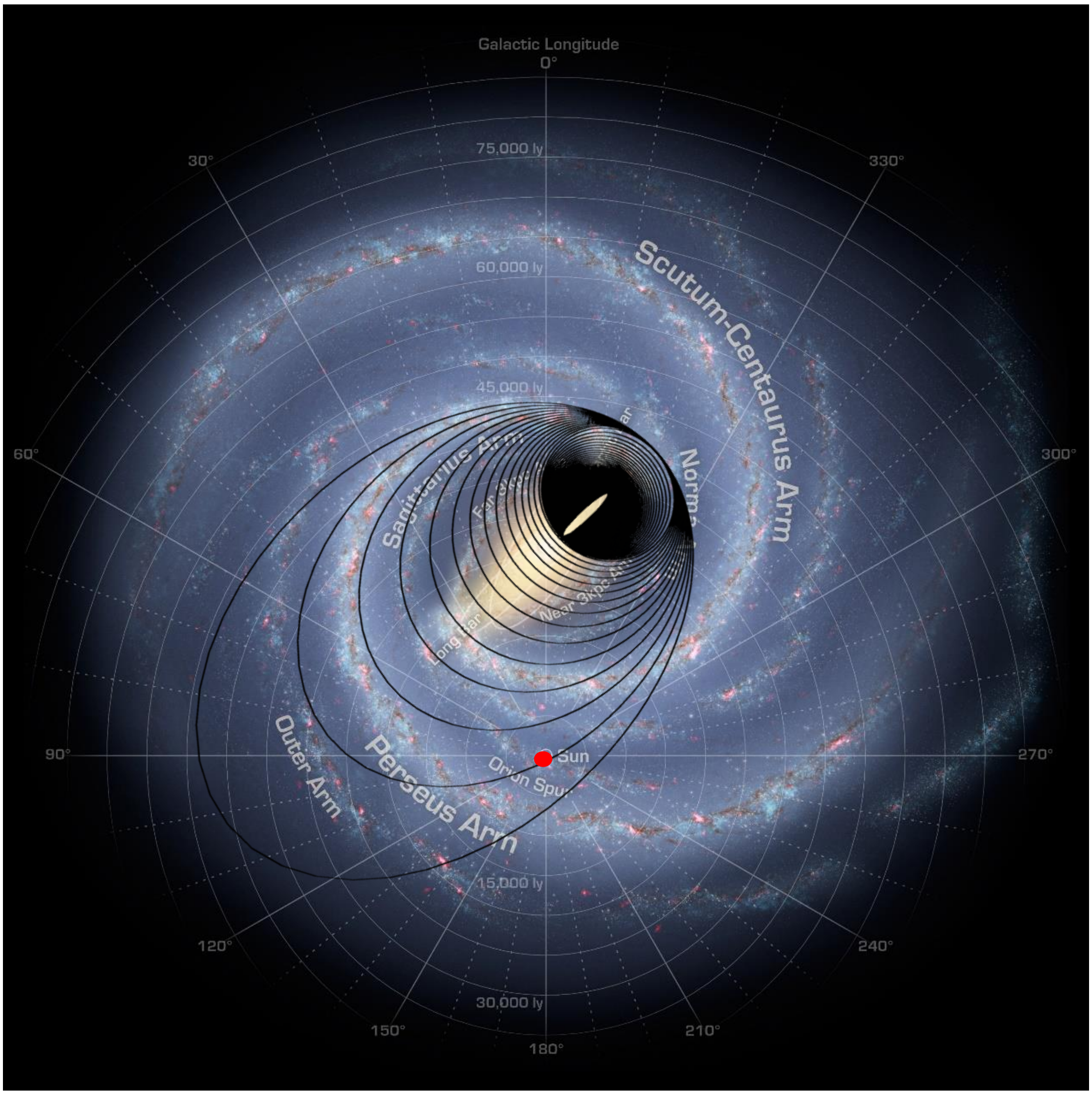

Figure 7. Superposition of calculation results with actual graphics of the Milky Way

图 7 中的计算结果为等比例缩放，这样可以获得与实际图案比较一致的距离参数。图中显示的计算结果与实际的银河系图形叠加在一起，可以帮助我们更清楚到看出白洞抛射出太阳系

之后轨道运行的情况。图中红点为太阳系所在位置。

图中计算结果中心位置轨道密集区域与银河系中心条状结构的光亮是基本重合的。当然计算结果只是覆盖了条状结构的一半。从银河系中心白洞抛射出来的质量的螺旋臂形状来看，相信银河系中心抛射质量的位置有两个对称的点。用同样的方法可以计算出条状结构的另一半，再将其叠加上去就可以获得完整的条状结构。

5 银河系中心质量的减少

当然如果本文假设了银河系中心的白洞会不断对太阳系进行加速。如果这个假设不成立，也可以考虑白洞不断抛射出质量之后，其本身的质量会不断减少。这样就会出现：

$$M' = M - \Delta M$$

由于轨道公式中

$$\frac{\alpha}{J} = \frac{GM}{mr^2v}$$

质量 M 和速度 v 是等比例变化的。因此速度的增加与银河系中心的质量 M 的减少效果是一致的。因此计算结果并不会改变。故这里就不再重新计算。

当然也可能银心质量的减少和太阳系速度的增加两种效应都存在。只是在银河系中心内部主要是白洞辐射能量导致太阳系被不断加速。而到了银河系中心外部，则主要是银河系中心白洞质量不断减少所产生的效应。这或许可以解决在太阳系远离银河系中心后还能够不断做扩散的螺旋运动的原因所在。

6 结论

在上个世纪七十年代，白洞理论曾经获得过学术界的关注。不过由于存在各种理论和实践方面的难题，导致对白洞的讨论在近几年来变得越来越少。在理论方面，目前用来讨论白洞的理论主要是广义相对论。在广义相对论中，白洞可以简单地理解为黑洞的时间反演。即将白洞理解成黑洞的逆过程。这样的理解存在的致命缺陷在于白洞的熵需要不断减少。这违背了目前已知的物理规律。因此目前白洞主要存在于各种科幻文学作品之中。而在时间观察方面，由于缺少相关的观察证据，对于白洞是否存在很多人还是存有很大的疑问的。毕竟目前关于黑洞的直接证据也是非常稀少的。尽管如此，也还是有一些研究者提出了目前宇宙中可能存在白洞的一些重要证据[6]，这值得我们重视。

利用白洞来解释银河系的结构有着很多优势。毕竟银河系的螺旋结构如果从银河系中心是一个巨大的黑洞这样的假设来进行理解，存在很多难以解释的现象，包括银河系中心存在的大量反物质辐射、大量星系的产生、极高的亮度，银河系中心的隆起结构等。而如果从白洞这一假设来进行理解，则上述问题都会变得更加合情合理。

为了提供银河系中心为白洞的更多的证据，本文利用一些已知的数据进行了计算，结果发现在大约半径为 5000 光年的位置，银河系中心可以形成一个有别于外围轨道的圆形结构的。如果再考虑到白洞抛射出来的质量做椭圆运动，则可以解释银河系中心的高亮度条状结构。

再考虑到银河系中心白洞的高速旋转，则这些抛射出来的质量所做的不断向外扩散的螺旋运动则可以形成现在我们观察到的螺旋星系所特有的螺旋臂结构。这就如同旋转的烟花所产生的螺旋形状火花的效果一样。

将计算出来的太阳系运行螺旋轨道与实际的银河系图案进行对比，可以发现二者能够比较好地重合在一起。这也为白洞模型提供了比较好的支持。

计算结果还表明，太阳轨道在银河系隆起部分运行的时间大约持续了 28 亿年。对照地球生物进化过程可以发现，在地球诞生后的三十亿年时间内，地球表面的温度都是非常高的。只是在大约二十亿年的时候才出现了单细胞生物。说明在这段时间中，地球的环境不适合高等生物的生长和进化。而太阳系脱离了银河系中心隆起部位之后，又运行了大约 18 亿年。这期间，太阳系大约有十多亿年的时间是在隆起部分的附近运行，因此环境也并不是特别好。对照地球生物进化过程，地球在三十八亿年之前也只有简单生物的出现。这也是与计算结果基本一致的。而到了四十亿年之后，太阳系已经远离银河系中心的白洞，这时候太阳系被白洞辐射到的能量已经减少了很多，此时地球上的环境开始变得更加适合生物的进化。因此在这之后，地球上出现了鱼类、恐龙以及人类等高等生物的进化。

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附录：计算程序（Excel VBA）

Parameters

vs	2.40E+05	The initial velocity of solar in 5000 l.y. distance.	1
			2
m	2.00E+30	Solar's mass	3
			4
			5
			6
G	6.67E-11	Gravitational constant	7
DD	1.00E+16	Convert 1 l.y. to seconds	8
Epsi	0.805394		9
xmin	636	The min value of x-axis po sition	10
xmax	5555		11
T	408.4501	Period of orbits, in Million years	12
ymin	3413		13
ymax	6526		14
DtM	3.10E+13	Convert Million years to seconds	15
Distance	27141.19	The distance between Solar and GC (light year)	16
Time			17
Rmax	39291.93	The max Radius of orbit	18
Ttime	4038.283	Total time of spiral orbit. In Million years	19
Ttimeinner	2195.965	Total time of inner orbit of GC bugle	20

Programs

```
Sub OrbitsSamples() ‘Calculate some orbits of solar system
Dim C, Epsi, Alpha, J, E, m, r, Omiga, G, Mc, v, x, y, DD, vs, Thita, T, DtM
Set Shp = Worksheets(3)

DtM = Sheet1.Cells(15, 2)
DD = Sheet1.Cells(8, 2)
```

```
G = Sheet1.Cells(7, 2) 'gratitivity constant
m = Sheet1.Cells(3, 2) 'Solar's mass
vs = Sheet1.Cells(1, 2) 'Solar's orbit velocity
Mc = 200 * 10 ^ 8 * m 'Galactic Center's mass

For ii = 9 To 5 Step -1
    vs = vs * ii * 0.1
    r = 5000 * DD
    Alpha = G * Mc * m
    J = m * 5000 * DD * vs
    E = 0.5 * m * vs ^ 2 - Alpha / r
    sqroot = 1 + 2 * J ^ 2 * E / (m * Alpha ^ 2)
    If sqroot < 0 Then
        GoTo Endprogram
    End If
    Epsi = Sqr(1 + 2 * J ^ 2 * E / (m * Alpha ^ 2))
    Sheet1.Cells(9, 2) = Epsi
    For i = 1 To 101
        Thita = 3.14 * 0.02 * i
        J = J * 1
        v = J / (m * r)
        C = (m * Alpha / J ^ 2)
        r = 1 / (C * (1 + Epsi * Cos(Thita)))
        Sheet1.Cells(i, 4) = v
        Sheet1.Cells(i, 5) = Thita
        Sheet1.Cells(i, 6) = r / DD
        x = 4000 + Int(r * Cos(Thita) / DD / 9)
        y = 4000 + Int(r * Sin(Thita) / DD / 9)
        Sheet1.Cells(i, 7) = x
        Sheet1.Cells(i, 8) = y

        If i = 1 Then
            beginX = x
            beginY = y
        End If
        endX = x
        endY = y
        With Shp.Shapes.AddLine(beginX, beginY, endX, endY).Line
            .Weight = 4
            .DashStyle = msoLineSolid
            .ForeColor.RGB = RGB(0, 0, 0)
            If i = 120 Or i = 150 Then 'Solar system location
                .Weight = 20
                .ForeColor.RGB = RGB(255, 0, 0)
```

```
            End If
        End With

        beginX = endX
        beginY = endY


    Next
    xmin = Sheet1.Cells(10, 2)
    xmax = Sheet1.Cells(11, 2)
    ymin = Sheet1.Cells(13, 2)
    ymax = Sheet1.Cells(14, 2)
    a = (xmax - xmin) * 9 * DD / 2
    T = Sqr(4 * 3.14 ^ 2 * a ^ 3 / (G * Mc)) / DtM
    Sheet1.Cells(12, 2) = T
    With Shp.Shapes.AddShape(msoShapeRectangle, xmin + Int((xmax - xmin) / 2), ymax, 200,
100)
        .Name = "Note bar"
        .Fill.ForeColor.RGB = RGB(255, 255, 255)
        .Fill.Transparency = 1
        .Line.Visible = 0
        .TextFrame.Characters.Text = Format(T, "0.0")
        .TextFrame.Characters.Font.Size = 50
        .TextFrame.Characters.Font.ColorIndex = 1
        .TextFrame.MarginTop = 0
        .TextFrame.MarginBottom = 0
    End With
Endprogram:
Next ii

End Sub

Sub SpiralObits() ‘Calculate the continuously spiral orbits of solar system
Dim C, Epsi, Alpha, J, E, m, r, Omiga, G, Mc, v, x, y, DD, vs, Thita, T, DtM, Delt, TTime, TTimein
Set Shp = Worksheets(3)

DtM = Sheet1.Cells(15, 2)
DD = Sheet1.Cells(8, 2)
G = Sheet1.Cells(7, 2) 'grativity constant
m = Sheet1.Cells(3, 2) 'Solar's mass
vs = Sheet1.Cells(1, 2) * 0.1 'Solar's orbit velocity
Mc = 200 * 10 ^ 8 * m 'Galactic Center's mass
Delt = 3E+52
```

```
For i = 1 To 12800
    vs = vs * 1.0002
    r0 = 5000 * DD
    Alpha = G * Mc * m
    J = m * 5000 * DD * vs
    E = 0.5 * m * vs ^ 2 - Alpha / r0
    sqroot = 1 + 2 * J ^ 2 * E / (m * Alpha ^ 2)
    If sqroot < 0 Then
        GoTo Endprogram
    End If
    Epsi = Sqr(1 + 2 * J ^ 2 * E / (m * Alpha ^ 2))
    Sheet1.Cells(9, 2) = Epsi
    Thita = 3.14 * 0.02 * i
    C = (m * Alpha / J ^ 2)
    r = 1 / (C * (1 + Epsi * Cos(Thita)))
    Omiga = J / (m * r ^ 2)
    v = r * Omiga
    TTime = TTime + 3.14 * 0.02 / Omiga
    If r < 5000 * DD Then
        TTimein = TTime
    End If

    Sheet1.Cells(i, 4) = v
    Sheet1.Cells(i, 5) = Thita
    Sheet1.Cells(i, 6) = r / DD
    x = 5000 + Int(r * Cos(Thita) / DD / 9)
    y = 5000 + Int(r * Sin(Thita) / DD / 9)
    Sheet1.Cells(i, 7) = x
    Sheet1.Cells(i, 8) = y

    If i = 1 Then
        beginX = x
        beginY = y
    End If
    endX = x
    endY = y
    With Shp.Shapes.AddLine(beginX, beginY, endX, endY).Line
        .Weight = 4
        .DashStyle = msoLineSolid
        .ForeColor.RGB = RGB(0, 0, 0)
    End With

    beginX = endX
    beginY = endY
```

```
Next
xmin = Sheet1.Cells(10, 2)
xmax = Sheet1.Cells(11, 2)
ymin = Sheet1.Cells(13, 2)
ymax = Sheet1.Cells(14, 2)
a = (xmax - xmin) * 9 * DD / 2
T = Sqr(4 * 3.14 ^ 2 * a ^ 3 / (G * Mc)) / DtM
Sheet1.Cells(12, 2) = T
Sheet1.Cells(19, 2) = TTime / DtM
Sheet1.Cells(20, 2) = TTimein / DtM
Endprogram:

End Sub
```