

Beauty Index and the Origin of Gender

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Abstract It may be agreed by most people that the growth of each person or country is driven by the power of gender. However, human's understanding of gender origin is very little, and is solely based on the phenomenon of life on Earth. If humans raise up their head and look at the universe, its preliminary answer may emerge. In the history of mankind, the first person who was surprised at the look of cosmic gender is possibly the famous French scientist Henri Poincaré. He, at the conclusion of the preface to his book, 'Hypthéses Cosmogoniques', states "One fact that strikes everyone is the spiral shape of some nebulae; it is encountered much too often for us to believe that it is due to chance. It is easy to understand how incomplete any theory of cosmogony which ignores this fact must be. None of the theories accounts for it satisfactorily, and the explanation I myself once gave, in a kind of toy theory, is no better than the others. Consequently, we come up against a big question mark." Now that humans enter the era of twenty-first century, Dr. Jin He, based on sufficient evidences, shows that the spiral pattern of galaxies is the male character of the universe.

keywords: Gender Origin, Galaxy Structure, Spiral Pattern, Heaven Breasts

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1 The Origin of Material Constituents in Human Life

As we all know, all material things are composed of elements. Hydrogen and helium are the two lightest elements in nature. Each hydrogen atom contains only one proton while each helium atom contains two protons. Except hydrogen and helium, any other atom contains at least three protons. Life's most precious material component is water, which is composed of two basic elements, hydrogen and oxygen, as shown in its molecular formula H_2O . Each oxygen atom contains 8 protons and 8 neutrons. Human bodies are organic, as characterized by containing carbon atoms. Each carbon atom contains 6 protons and 6 neutrons. Therefore, if there were no other elements available in the world than hydrogen and helium, it would be impossible for the formation of life. However, except hydrogen and helium, any other elements are very rare in the universe. Therefore, human life in the universe is very rare.

For example, the Solar system contains the Sun, eight planets, asteroid belt, and other minor substances (such as comets, planetary satellites). But the mass of the Sun itself is more than 98% of the total of the Solar System. What is the composition of the Sun?

Analysis of the solar spectrum shows that more than 99% of the mass of the Sun are composed of the lightest two elements, hydrogen and helium. In the universe, the most common entities are stars which are similar to the Sun. Therefore, only material structures other than stars in the universe can nurture life. In the universe, only galaxies are the structures greater than the solar system, while being relatively independent. The galaxy which hosts humans is called the Milky Way. There are only two types of galaxies (if we consider stable and weakly interacted entities only). One type has a three-dimensional elliptical shape; and the other has a flat spiral shape. Surprisingly, in elliptical galaxies, almost no substances other than stars can be observed. Therefore, the chance of life existing in an elliptical galaxy is almost zero. Human beings live in a flat spiral galaxy that is different from elliptical ones.

There are gas and dust in spiral galaxies. Gas and dust present the elements which are heavier than hydrogen and helium. Therefore, human life is originated from gas and dust. Based on sufficient evidences, this article shows that gas and dust in galaxies are the result of the interaction between cosmic male character and cosmic female structure. Therefore, if there existed no male character in the universe, there would be no gas and dust in the universe. Accordingly, there would be no Earth's biosphere and human life.

2 Jin He's Pioneering Study on Galaxies

Jin He earned his master's degree in elementary particle theory in 1994 from East China Normal University and his PhD in astrophysics in 1998 from Yunnan Observatory, Chinese Academy of Sciences. At that time he paid great attention to quantum gravity and nonlinear science. When facing complicated astronomical data during his first PhD program, Jin He adopted the primitive method of nonlinear science: Calculating the ratios of relevant two data values. With the method, he published two papers [1,2], and was granted the doctorate degree. In January 1999, Jin He came to the United States to earn his second PhD in the Department of Physics, University of Alabama. At first, his advisor was Dr. Jack Sulentic. But his mind was still full of the concepts of quantum gravity and scale relativity [3]. Therefore, after a year and half, he was transferred to Dr. Ronald Buta to study galaxy images. Jin He was greatly enjoyed in accessing astronomical computer software and analyzing galaxy images in Summer 2000. Because the gravitational theories of both Newton and Einstein deal with the interaction of two bodies, Jin He was extremely confused on how stars gather together to form a majestic galaxy. Those theories are impossible to explain the interaction among many similar free bodies. Therefore, Jin He recalled the primitive method of nonlinear science and applied it to the analysis of galaxy images: Calculating the ratios of relevant two data values. Specifically, Jin He selects a small circle on the galaxy image plane and study galaxy light distribution within the circle. The primitive method of nonlinear science is to select a diameter of the circle, calculate the total amount of light within each semicircle. Since the light distribution is uneven, the two totals are not equal. The ratio of the two values describes the uneven light distribution within the circle. This story happened in the Spring of 2001. Then Jin He drew a curve on the galaxy image plane, and drew many circles along the curve which the circles center at. Therefore, different section of the curve becomes the approximate

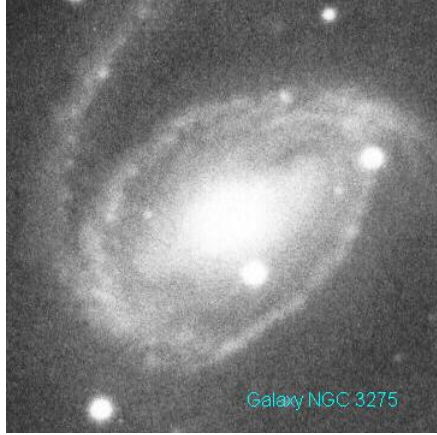


Figure 1: Image of galaxy NGC 3275 with optical light (shorter-wavelength light).

diameter of each circle. Each circle is divided into two halves, and as described above, Jin He calculated the ratio of the total amount of light contained in each semicircle. This happened in the Winter of 2001. Based on the image analysis of several dozens of galaxies [4], Jin He found out that there exist spiral curves on galaxy image plane and the above-said ratios are approximately constant along each curve. Jin He called this kind of curves the proportion curves meaning that the ratio of galaxy light from two sides of the curve is constant along the curve. Now, Jin He calls this kind of curves the Darwin curves [5]. Jin He further found out that there exist many such curves and they form a net of orthogonal curves. Accordingly, Jin He put forward a scientific concept.

3 Heaven Female Structure

Heaven Female Structure: The density of material distribution on a plane is not arbitrary. For a special net of orthogonal curves on the plane, if the ratio of the material densities from two sides of each curve from the net is constant along the curve, the curve is called a proportion one. The net of curves is called an orthogonal net of proportion curves. Such a structure of material distribution is called a rational structure. From now on, we called it heaven female structure, or simply female structure. Its net of orthogonal curves is called the vascular network of the female structure. There are other curves which do not belong to the above net but the ration of light distribution along the curves is still constant. All these proportion curves are called Darwin curves [5].

At first, Jin He thought that the spiral arm pattern was a female structure. Therefore, from the Spring of 2002 to the Summer of 2004, Jin He was diligently looking for such spiral-shaped net of orthogonal curves that its corresponding female structure would be a spiral arm pattern. However, he failed the search. After a great amount of failure, He finally realized that female structure is a highly harmonic beauty and a physical manifestation of cosmic maternal character. In contrast, the spiral patterns, though

majestic and marvelous as French scientist Poincaré indicated, lack the harmony and quiet beauty, and are not female structure. In the end of 2004, Jin He finally made an important discovery: The axisymmetric structure

$$\rho(x, y) = d_0 \exp(d_1 r) \quad (1)$$

where $r = \sqrt{x^2 + y^2}$, is a female structure. Its net of orthogonal curves is composed of all golden spirals.

This is probably one of the most important discoveries in human history. Why? Relatively independent spiral galaxies belong to two types. A galaxy with a bar is called a barred spiral galaxy, and a spiral galaxy without a bar is called a ordinary spiral galaxy. The name ‘spiral’ means the presence of more or less spiral-shaped patterns on any spiral galaxy image. However, the spiral arms are the demonstration of gas and dust on the galaxy image (see Figure 1). It is a kind of disguise. For example, an optical image of a farmland in Spring on Earth is mainly a reflection of leaves, flowers, and grass etc. If we use infrared radiation to shoot its image then it presents the geological features of the Earth instead of a Spring scene. Similarly, longer-wavelength galaxy images present stellar density distribution, and those scatters of gas and dust disappear mostly. Astronomers further found out that the stellar density distribution of ordinary spiral galaxies is basically an axisymmetric disk as described by the formula (1), called the exponential disk. Astronomers have also found out that, in ordinary spiral galaxies, spiral arms (i.e., gas and dust) follow the direction of golden spirals (see Figure 2). We have already known that the net of orthogonal proportion curves in exponential disk is composed of all golden spirals. This is definitely not a coincidence. Here comes the important evidence of heaven rationality:

Evidence A: Exponential disk is a heaven female structure, and its net of orthogonal proportion curves are all gold spirals; The stellar density distribution of ordinary spiral galaxies is the exponential disk, and the spiral arms of ordinary spiral galaxies follow the direction of golden spirals (see Figure 2).

If we consider the origin of the universe is from cosmic gender then Jin He’s galaxy study can be easily explained by the cosmic female and male characters.

4 X and Y Chromosomes [6]

Almost all genetic information of a normal person is present in the 46 chromosomes of the cell nucleus (mitochondrials present a small amount) of which 44 are called autosomes with no gender difference while the remaining two have gender difference (one is called X and the other Y). The female has two X (denoted by XX), and the male has one X and one Y (XY). In the evolutionary process, X and Y were derived from the autosomal. At first there was no difference between X and Y. Later on Y went to be specific and able to determine the male. In its development, Y also obtained some genes from X. Therefore, simply put, the origin of the male depends on the female.

The Y chromosome of men (and mammals) has other peculiarities too. A cursory comparison of the Y with other chromosomes suggests that Y always wants to be the dominant and successful. The presence of Y, with or without X, always indicates a

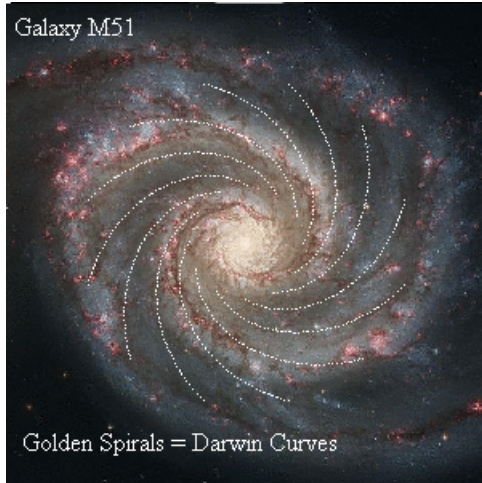


Figure 2: Image of ordinary spiral galaxy M51 with optical light. Its arms follow the proportion curves of the female structure (the exponential disk).

male. In contrast, the presence of X can not fully determine the sex. It depends on the presence of Y. The Y chromosome is selfish, and its purpose of existence is mainly the continuity of its species. Y takes less care of other chromosomes and contributes less to collective structure. X and other chromosomes except Y exist in both sexes: mothers' X chromosome can be passed to both son and daughter whereas Y exists only in men and is passed only from father to son.

5 The Origin of Spiral Arms in Spiral Galaxies

In this Section, we consider only ordinary spiral galaxies. As we have said above, the spiral arms of spiral galaxies are a reflection of gas and dust on galaxy images. The smooth distribution of stars is the main structure of spiral galaxies. Astronomers found out that the main structure is approximately an axisymmetric disk, that is, the exponential disk. It is a heaven female structure. In general, the subtraction of the fitted female structure from the image of an ordinary spiral galaxy is a spiral-shape error pattern which follows the distribution of gas and dust. This error pattern is exactly the arms of spiral galaxies. This clearly shows that the spiral arms of spiral galaxies are originated from the exponential disk. That is, they are originated from the female structure. In other words, the spiral arms are a disturbance to the female structure (the exponential disk). We call this cosmic disturbance (or impulse) the male character in the universe. The spiral arms of spiral galaxies are the result of disturbing waves developed in the female structure. This disturbance is not arbitrary. In order to achieve the minimum disturbance, the disturbing waves follow the Darwin curves of the female structure. In the case of ordinary spiral galaxies, they follow the golden spirals as indicated in Figure 2.

Now we come to the conclusion that, in the origin of life and growth, rationality is not the only cause. Another cause is the disturbance to the rational structure. Elliptical

galaxies do not show much evidence of life, and the disturbance to their female structure is hard to be observed. For example, Elliptical galaxies present no significant arms. Images of spiral galaxies show that the greater the disturbance to the female structure, the more dusts and gases resulted, and the greater the events of star birth. Only dusts and gases contain significant amount of elements that are heavier than hydrogen and helium which the human body needs!

Similarly, the biosphere on Earth is the result of harmonic disturbance to the earthly female structure. If the disturbance around Earth was not harmonic enough, Earth would become a barren planet as Mars, or Saturn, etc.

6 Heaven Breasts and Barred Spiral Galaxies [7]

The images of galaxies seen on the internet are mostly spiral galaxies and taken with visible light. Those majestic patterns of arms are the results of harmonic disturbance to heaven female structure. If we want to study the origin of barred spiral galaxies, we must learn from the French scientist Poincaré's lesson. We should not be fooled by the loud creation by cosmic male character (see Figures 1 and 2). The creation by male character is not as harmonic and quiet as the female structure. Therefore, we study the infrared or other longer-wavelength images of barred spiral galaxies where the spiral-shaped pattern of gas and dust is mostly gone. The resulting images show the harmonic and quiet stellar distribution (see Figure 3 which presents the simulated galaxy NGC 3275). Different from the images of ordinary spiral galaxies, we see a smooth bar-shaped pattern. We want to prove that the bar pattern is also a female structure in the universe.

Astronomers have found out that the main structure of barred spiral galaxies is also the exponential disk. Therefore, we do the subtraction of the fitted exponential disk from a barred spiral galaxy image. What is the left over? Jin He discovered that the left-over resembles the breasts of human female (see Figure 4). Jin He calls it double-breast structure or heaven breasts [7]. Barred spiral galaxies, however, have more than a pair of breasts. The bar of barred spiral galaxies is composed of two or three pairs of heaven breasts which are usually aligned. The addition of the two or three pairs of breasts to the major structure of exponential disk becomes a bar-shaped pattern which crosses galaxy center (see Figure 3).

The structure of heaven breasts is also a female structure. Its net of orthogonal proportion curves (vascular network) is composed of all confocal ellipses and confocal hyperbolas. Here we present a conjecture: the uniqueness of heaven breasts.

Uniqueness of Heaven Breasts: Heaven breasts is the only non-axisymmetric rational structure. In other words, any non-axisymmetric rational structure is either a heaven breasts itself or an addition of a number of heaven breasts to a special axisymmetric rational structure.

We hope that the conjecture will be proved or disproved in some day.

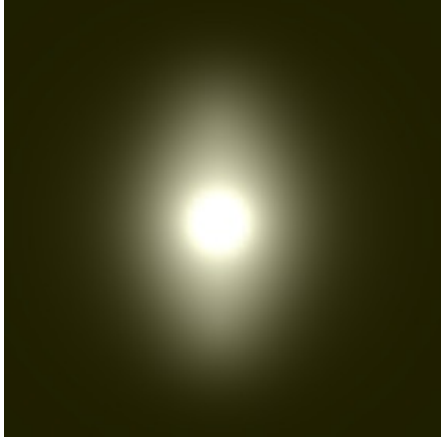


Figure 3: The simulated galaxy NGC 3275, i. e., the superimposed structure of heaven breasts and exponential disk.

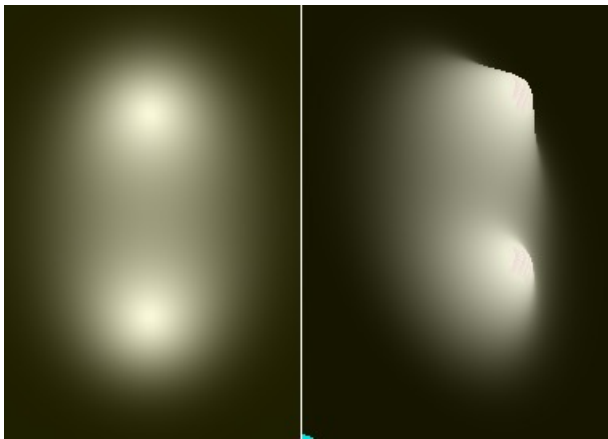


Figure 4: Left panel is the planar graph of double-breast structure, and right panel is its corresponding 3-dimensional demonstration. The graph and demonstration are based on Galaxy Anatomy graphic software.

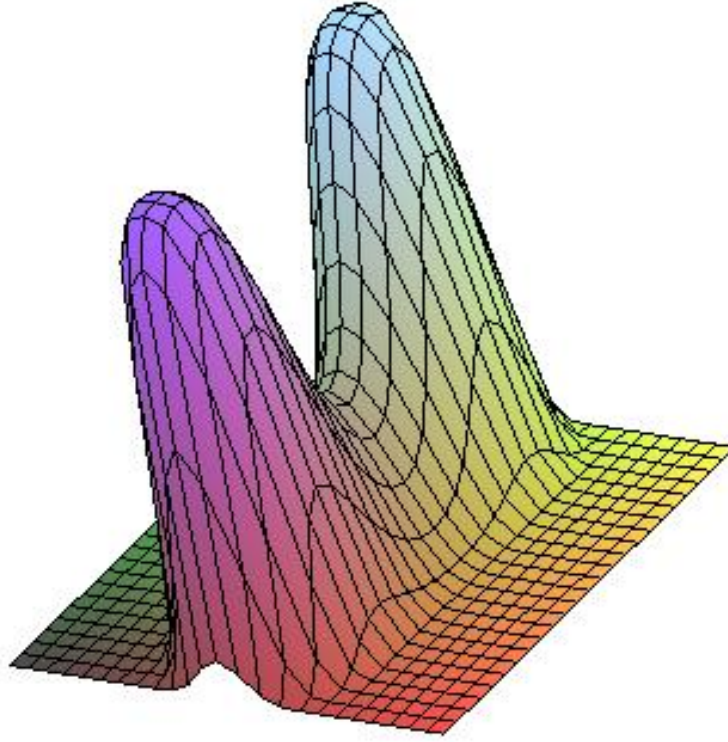


Figure 5: Ugly breasts with its index being 2.00. The graph is produced with Maple software.

7 Beauty Index

Here we present the simplest algebraic formula of Heaven Breasts and point out that the structure is a beauty whose beauty index is 0.75. In the article [7], Heaven Breasts is described by the following function:

$$\begin{aligned}
 \rho(x, y) &= b_0 \exp f(x, y), \\
 f(x, y) &= (b_2/3) (q(x, y) + b_1^2 x^2 / q(x, y))^{3/2}, \\
 q(x, y) &= (r^2 - b_1^2 + \sqrt{(r^2 - b_1^2)^2 + 4b_1^2 x^2}) / 2
 \end{aligned} \tag{2}$$

The formula looks complicated. We can do the familiar trick in middle school classes to eliminate the radical in the denominator of the equation (2). That is, we rationalize the denominator by multiplying simultaneously the denominator and the numerator by the conjugate of the denominator. The result is:

$$\rho(x, y) = b_0 \exp \left((b_2/3) \left((r^2 - b_1^2)^2 + 4b_1^2 x^2 \right)^{3/4} \right) \tag{3}$$

This formula is very simple. It represents the heaven beauty whose beauty index is $3/4$ (or 0.75). Changing the index to other values, e. g., 2.00 and 0.50, we have the corresponding graphs as shown in Figures 5 and 6 respectively. Here we come to a big discovery:

Evidence B: The breasts of larger index (> 0.75) and smaller index (< 0.75) can not be fitted to barred galaxy images.

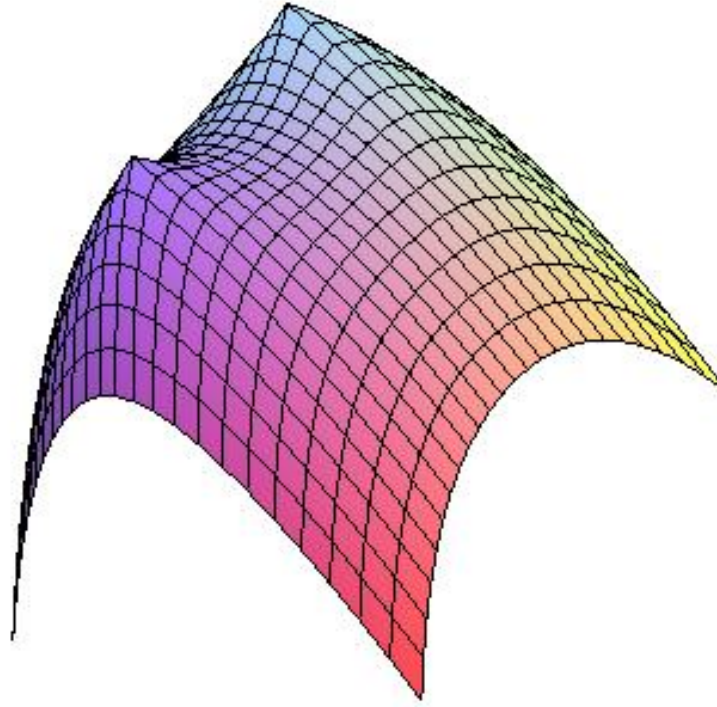


Figure 6: Ugly breasts with its index being 0.50. The graph is produced with Maple software.

8 More Evidences of Cosmic Gender

We know that any physical theory proposed up to now has involved some basic quantity which must have a unit. However, astronomical unit, e. g., distance or size, is very hard to be measured. The readers may be curious about that Dr. Jin He has not discussed any physical unit in his galaxy study. No, Dr. Jin He does not need any unit in his galaxy study. The study is solely based on the concept of rational structure, i. e., the concept of heaven female structure. The structure is solely derived from the principle of proportionality, and the result is a pattern of self-similarity. Therefore, Jin He's galaxy study does not depend on the choice of physical units [7]. Astronomical observation confirms Dr. Jin He's study, and here we present the self-similarity property of galaxy patterns:

Evidence C: In the universe, relatively independent galaxies, large or small, far or near, show the same structure which is classified as the galaxies of ordinary spirals, barred spirals, and ellipticals. All can be fitted to Dr. Jin He's rational structure without the need of physical units [7].

Although spiral galaxies are flat and considered to be two-dimensional, they still have a certain thickness. Does the vertical structure need physical units? We use z to describe the vertical direction and r to describe the horizontal direction as seen on an edge-on spiral galaxy image. Astronomical observation shows that the stellar density distribution on an edge-on spiral galaxy image can be described by a formula whose variables z and r can be separated:

$$\rho(r, z) = f(r)g(z). \quad (4)$$

This means that the ratio of galaxy light from two sides of any vertical straight line is

constant along the line. This is the further evidence of rational galaxy structure:

Evidence D: Spiral galaxies considered to be 3-dimensional are still rational structure.

9 Spider Diagram and Galaxy Rings

We know that exponential disk and heaven Breasts are each heaven female structure. Our model of barred spiral galaxy is the attachment of two or three pairs of heaven breasts to the exponential disk. Is the superimposed structure still rational? That is, can we find a net of orthogonal curves so that the combined density distribution is proportional along each curve from the net? The original curves of golden spirals, confocal ellipses, and confocal hyperbolas are no longer proportion curves. Dr. Jin He obtained a sufficient condition in 2011 [8]. Direct numerical application of the condition to several galaxy images indicates that the sufficient condition is approximately satisfied. But its deep investigation is needed.

If the superimposed structure is rational then what is its net of orthogonal proportion curves? What does the net of curves look like? We know that the net of curves at any point reduces to a ‘cross’ along a fixed direction. In 2010, Dr. Jin He found out an algebraic equation which determines at each point the direction of the cross. The equation is called instinct equation [9]. This algebraic equation is of order three, and can be factorized. Based on the analysis of barred galaxy images, we found that the discriminant of the quadratic factor is approximately zero. Therefore, the instinct equation corresponding to barred galaxies has a repeated real root. The direction represented by the root is the direction of the cross at each point. Calculating all crosses on the galaxy image plane, we have a net of crosses which connect into a net of orthogonal curves. This is the net of proportion curves for the rational superimposed structure. The net of curves is spider-shaped which is called the spider diagram of barred spiral galaxies (Figure 7). Based on the analysis of several galaxy images, we have more evidence of rational galaxy structure:

Evidence E: The ring pattern of barred spiral galaxies is approximately coincident with the ellipses in its corresponding spider diagram.

More evidences can be found in the article [10].

10 Galaxy Anatomy Graphic Software

We know that the stellar density distribution of barred spiral galaxies can be fitted to heaven female structure. The article [11] showed that the stellar density distribution of elliptical galaxies can be fitted to heaven female structure as well. Heaven female structure is completely determined by its net of orthogonal proportion curves. However, the birth of cosmic life is not solely determined by the female structure. The birth event happens from the disturbance of female structure. This disturbance is called the male character of the universe. The disturbance is not arbitrary. It develops along the proportion curves of the female structure. The proportion curves is also called Darwin curves.

In order to promote human exploration of the universe, Dr. Jin He designed a galaxy anatomy graphics software. Any person, regardless of race, age, or gender, can purchase

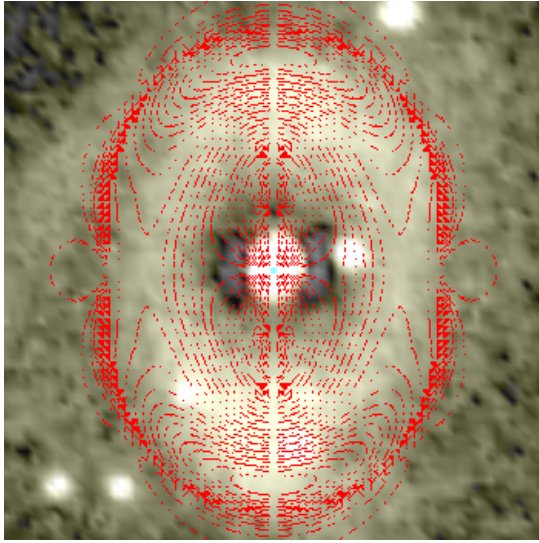


Figure 7: Spider diagram for the corresponding model of barred galaxy NGC 3275 (see Figure 3).

the software to seek the truth on heaven, to find more evidences of cosmic gender as scientists did to the discovery of X and Y chromosomes. Of course, people might find the evidence that Dr. Jin He's exploration was wrong. In the era of unlimited dissemination of internet information, no human power can stop public exploration of Heaven. Galileo's tragedy will no longer happen. Mankind's discovery of X and Y chromosomes in the microscopic world is the identification of physical origin of human gender. If Dr. Jin He's proposition is correct then Heaven is the spiritual origin of human gender. If Dr. Jin He's galaxy exploration is further verified by other people then we expect that the Earth will thrive both harmonically and eternally.

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