Exploration

Sacred Number & Consciousness

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Abstract

Someone who knows that planets are moving in periodic curves do not pay attention why? From infinity of natural numbers only *n = 2* is valid number for Universe we lived on. For ranges of gravity and electromagnetic fields are crucially described by *n = 2* as it will be shown in this paper. Human consciousness do not invent it. It was done *a priori* human knowledge.

Keyword: Sacred number, consciousness, Universe.

1. The sacred mathematics/physics

During my work as a lecturer in Physics Department, Warsaw University, I like very much the Kepler-Copernicus (Kopernik in Polish)-Newton panorama of the planet moving. I started as usual with historical facts and write the basic equations. I left of all steps and start from the equation:

$$\frac{d^2u}{d\Theta^2} + u = -\frac{m}{L^2}\frac{1}{u^2}F\left(\frac{1}{u}\right),$$
$$u = \frac{1}{r}. \tag{1}$$

Equation 1 is the master equation which describes the movement of the body with mass m in the field of central forces F(1/u). We can imagine the following functions F(1/u)

$$F\left(\frac{1}{u}\right) = K_1 u^{\pi}, \quad K_2 u^3, \quad K_3 u^2, \quad K_4 u^{0.64}, \quad K_5 u^{-4.62}. \tag{2}$$

We can imagine the "other" universes for which the central forces have the different F(1/u). But can life be originated and developed in all these universes? This question is answered by the anthropic principle and will be discussed later on. For the moment, we can say the following: Macroscopic structure of the Universe we live in can be understood with just two forces: Newton and Coulomb. For both forces,

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$$F\left(\frac{1}{u}\right)=Ku^2. \tag{3}$$

Why? With the forces described by formula (3) we obtain for equation (1)

$$\frac{d^2u}{d\Theta^2}+u=-\frac{Km}{L^2}. \tag{4}$$

with constant on the right hand side of the equation - only for quadratic in u forces. Can you imagine! This is miracle, is not ?

This beautiful equation describes the classical motion of the planets, and electrons round the source of the force F = Ku^2. Moreover, the equation (4) in fact is the harmonic oscillator equation which can be solved at once. The solution to the eq. (4) can be written as

$$u=A\cos(\Theta-\Theta_0)-\frac{mK}{L^2}, \tag{5}$$

or

$$r=\frac{1}{A\cos(\Theta-\Theta_0)-\frac{mK}{L^2}}. \tag{6}$$

Equation (6) describes the conic curves: ellipse, parabola and hyperbola depending on constants A, Θ_0, m, K and L. We can choose our coordinate axes so that Θ_0= 0 to simplify things just a little:

$$r=\frac{1}{A\cos\Theta-\frac{mK}{L^2}}. \tag{7}$$

This is a conic sections. From plane geometry, any conic section can be written as

$$r=r_0\frac{1+e}{1+e\cos\Theta}, \tag{8}$$

where e is called the eccentricity of the orbit.

2. Other dimensions

In any higher organism, a large number of cells must be interconnected by nerve fibers. If space had only two dimensions, an organism could be only a two-dimensional configuration and its nerve paths would cross. At the intersections, the nerves would have to penetrate each other, for absence of a third dimension would not permit a fiber to be led above or below another one. As a consequence nerve impulses would mutually interfere. The existence of a highly developed organism having many non-intersecting nerve paths is possible only in a space having at least three dimensions.

As we know both the Newtonian gravitational force and electrostatic force can be described in the three dimensional space (formula (9))

$$F = \frac{K}{r^2}, \qquad n = 3, \tag{9}$$

where n is the number of dimension of space. For *n* not equal to 2, the natural generalization is:

$$F = (n-2)\frac{K}{r^{n-1}}, \qquad n \neq 2. \tag{10}$$

The impossibility of stable planet orbit for n > 3 can be seen in an elementary way. Let *m* be the mass of planet and L angular momentum (which is constant for the central force (1.181))

$$L = mr^2\dot{\Theta} = \text{const.} \tag{11}$$

The gravitation potential for the conservative force will be

$$V = -\frac{K}{r^{n-2}}. \tag{12}$$

At the extreme distances from the central body for a planet with mass m, we have

$$\frac{dr}{dt} = 0. \tag{13}$$

The kinetic energy T at such points is

$$T = \frac{p^2}{2m} = \frac{1}{2}mr^2\dot{\Theta}^2, \tag{14}$$

then

$$T = \frac{L^2}{2mr^2}. \tag{15}$$

By conservation of mechanical energy T + V = constant, or

$$\frac{L^2}{2mr_1^2} - \frac{K}{r_1^{n-2}} = \frac{L^2}{2mr_2^2} - \frac{K}{r_2^{n-2}}, \tag{16}$$

where r_1 is the minimum distance from the central body and r_2 is the maximum distance, perihelion and aphelion respectively.

The equation (16) shows that for n = 4 there can be a finite, positive solution only if $r_2 > r1$ For n > 4 it can be shown that an orbit in which r oscillates between two extremes is likewise ruled out.

In general the centripetal force in a circular orbit is

$$F_c = mr^2\dot{\Theta}^2. \tag{17}$$

Using Eq. (15) this becomes

$$F_c = \frac{L^2}{mr^3}. \tag{18}$$

In the actual eccentric orbit, the attractive force must be less than this centripetal force at perihelion, for then the planet is about to move outward. At aphelion, it is just the other way around.

These conditions can be expressed respectively by the following inequalities

$$F < F_c$$
$$\frac{(n-2)K}{r_1^{n-1}} < \frac{L^2}{mr_1^3} \quad \text{or} \quad \frac{K}{r_1^{n-2}} < \frac{L^2}{(n-2)mr_1^2}, \tag{19}$$

$$F > F_c$$
$$\frac{(n-2)K}{r_2^{n-1}} > \frac{L^2}{mr_2^3} \quad \text{or} \quad \frac{K}{r_2^{n-2}} > \frac{L^2}{(n-2)mr_2^2}. \tag{20}$$

$$\frac{L^2}{2mr_1^2} - \frac{L^2}{(n-2)mr_1^2} < \frac{L^2}{2mr_2^2} - \frac{L^2}{(n-2)mr_2^2}. \tag{21}$$

and

$$\frac{L^2}{mr_1^2}\left(\frac{1}{2} - (n-2)^{-1}\right) < \frac{L^2}{2mr_2^2}\left(\frac{1}{2} - (n-2)^{-1}\right). \tag{22}$$

This relation obviously cannot be true for n = 4, for then each of the brackets becomes zero. Remembering that $r_2 > r_1$ it also cannot be true for any n > 4, which makes the values of the brackets less than ½ .

Thus, the existence of an elliptic orbit for $n \geq 4$ is ruled out. The results for planetary orbits are collected in Table 1.

Table1. Planetary orbits

Phenomena	Cases thus excluded	
Bio-topology (existence of a highly developed organism)	n <3	
Stability of planetary orbits	n >3	
	n = 4	Possible only for circular orbit
	n >4	
	n < 3	Excluded if the potential is too vanish at ∞

In conclusion, it may be said that stable elliptical planetary orbits can exist and support the existence of the highly developed organisms only in three dimensional space. The miracle!

3. Conclusions

The range of the two forces which create the Universe are described by one n=2 natural number in spite of infinity of natural numbers. Only infinity Creator can chose only one number and used it to build up Universe.