International Invention of Scientific Journal
Available Online at http://www.iisj.in
eISSN: 2457-0958
Volume 03 | Issue 02 | February, 2019 |

"Masses of Celestial Bodies"

SERGEY ORLOV
Petrozavodsk State University, Russia

Original Article

OPEN ACCESS

Received: January 14, 2019
Accepted: February 01, 2019
Published: February 05, 2019

***Corresponding Author:**
*SERGEY ORLOV
Petrozavodsk State University, Russia
E-mail: *ion@sampo.ru*

Abstract

The calculation of the masses of celestial bodies based on the theory of vortex gravity, cosmology and cosmogony is proposed. The actual values of the masses of celestial bodies are two orders of magnitude greater than the generally accepted values.

Keywords: Vortex gravity, cosmology and cosmogony. Heavenly mechanics.

Introduction

The masses of all celestial bodies are determined on the basis of the theory world gravity theories. The author of this theory I. Newton [1]. Newton presented the gravitational interaction of two bodies in the equation:

$$F_{п} = G \cdot \frac{m_1 \cdot m_2}{r^2} \qquad (1),$$

where
m_1, m_2 - the masses of bodies 1 and 2, respectively, $G = 6.672\ 10^{-11}$ N · m2 / kg^2 is the gravitational constant, r is the distance between the bodies.
On the surface of the earth, this equation has the form:

$$F_n = g\,M \qquad (2),$$

where
M - the mass of the Earth
g - free fall acceleration.
From the known values of the acceleration of free fall g and G, the Earth's mass Me = 5.97 x 10^{24} kg was determined [2]. The average density of its substance is 5500 kg / m^3, which varies from values in the earth's crust — 2200 kg / m^3 to 13100 kg / m^3 in the core of the Earth. [3] In 1915, 1916 A. Einstein proposed the general theory of relativity [4]. In this theory, Newton's law was considered as a special case. In these theories, the general principle was the hypothesis about the property of a substance (body) to create the force of gravity. The masses of other celestial bodies were determined based on the third Kepler law [5] taking into account equation (1). The law of the world Newton (Einstein) has no experimental or theoretical evidence. Therefore, using this law in research, one can get contradictory results. In particular, according to the above method, the masses and densities of other planets of our solar system, including the Sun, were determined. The sun has a density of 1410 kg / m^3, the force of gravity on the surface F = 273.1 m [6] Saturn - density of 687 kg / m^3, gravity force F = 10.44 m. [7] Planet Earth has gravity on the surface less than the indicated celestial bodies, but the average density of the Earth greatly exceeds the density of both the Sun and Saturn. Sealing of any bodies, including celestial bodies, occurs under the influence of external forces. These forces can only be attributed to the forces of its own gravity. Consequently, neither the Sun nor Saturn can have a density several times less than that of the Earth. In addition, the average density of Saturn is less than the density of water. Then on the surface the density of these celestial bodies must be equal to the density of the gas. This is an absurd conclusion. Such contradictions appeared within the framework of the theory of universal gravity. Three hundred years ago, Newton's hypothesis was imposed on the world of scientists that bodies create the force of

gravity. All scientists, in their calculations, were based on this erroneous concept. Therefore, the results of these studies were erroneous. Newton himself was not sure about the gravitational properties of bodies (matter). He expressed that the cause of attraction may be a change in density in the space environment. But he could not find a scientific justification for this assumption. The author's theory of vortex gravity, cosmology and cosmogony [8] is free from this contradiction. On this basis, it is possible to determine the true masses of celestial bodies. The next chapter proposes the basic principles of the theory of vortex gravity.

Theory of Vortex Gravitation, Cosmology and Cosmogony

The theory of vortex gravity is based on the well-known astronomical fact - all celestial objects rotate. In the vortex gravity model, the condition is accepted that this rotation is inertial and was caused by the rotation of the ether. Ether is a cosmic, gaseous, extremely low dense substance. Ether forms in the world space a system of interconnected vortices. The orbital velocities of the ether in each vortex (torsion) decrease in the direction from the center to the periphery. Velocities decrease in accordance with the law of the inverse square of this deletion. According to the laws of aerodynamics - the lower the flow velocity, the greater the pressure in it. The pressure gradient generates a pushing force towards the zones with the lowest pressure, that is, towards the center of this torsion. Thereby, in the center of the torsion, cosmic substance is accumulated or created, from which a celestial body is generated.

Let us consider the vortex gravity equation obtained in the theory [8].

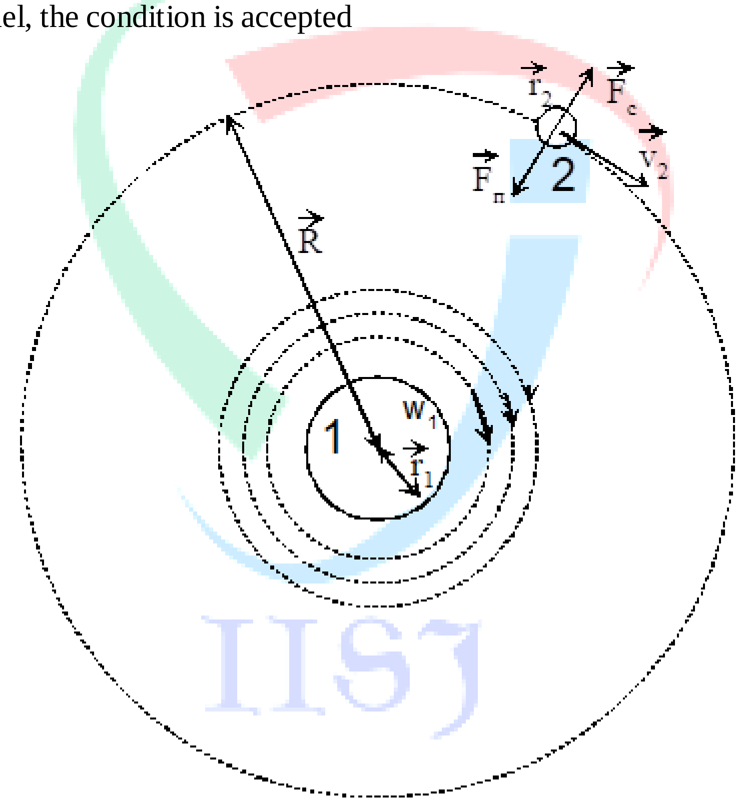

Figure.1: Two-dimensional model of gravitational interaction of two bodies.

The forces are shown acting on body 2: F_c – the centrifugal force, $F_п$ – the force of attraction of body 2 from body 1; v_2 – linear velocity of body 2 at the orbit, R – the radius of the orbit, r_1 – the radius of body 1, r_2 – the radius of body 2, w_1 – angular velocity of ether rotation at the surface of body 1, and m_2 are the mass of body 2. Next, we consider the appearance of the attraction force in more detail and derive a formula describing it. As was said above, a pressure gradient arises as the result of the vortex motion. Let's find the radial distribution of the pressure and the ether velocity. For this purpose, we write the Navier-Stokes equation for the motion of a viscous liquid (gas).

$$\rho\left[\frac{\partial}{\partial t}+\vec{v}\cdot \text{grad}\right]\vec{v}=\vec{F}-\text{grad}\ P+\eta\Delta\vec{v} \quad (3)$$

Where ρ is the ether density, $\vec{v}$ and P are, respectively, its velocity and pressure, and η - the ether viscosity? In cylindrical coordinates, taking into account the radial symmetry $v_r=v_z=0$, $v_\varphi=v(r)$, P=P(r), the equation can be written as the system:

$$\begin{cases} -\dfrac{v(r)^2}{r} = -\dfrac{1}{\rho}\dfrac{dP}{dr} \\ \eta\cdot\left(\dfrac{\partial^2 v(r)}{\partial r^2} + \dfrac{\partial v(r)}{r\,\partial r} - \dfrac{v(r)}{r^2}\right) = 0 \end{cases} \quad (4)$$

After transformations, an equation is obtained to determine the gravity forces in the ether vortex:

$$F = V_n \times \rho \times \frac{v_e^2}{r} \quad (5),$$

With the following relationship $v_e \sim \frac{1}{\sqrt{r}}$ where

V_n is the volume of nucleons in the body, which is in a torsion orbit with a radius of - r.

ρ = 8.85 x 10-12 kg / m3 - density of ether [4]

V_e - the speed of the ether in the orbit r

r - the radius of the considered ether-vortex orbit

Replace in equation (5) the volume of nucleons on their mass, using the well-known relationship:

$$V_n = m/\rho_n, \quad (6)$$

where

$\rho_n \sim 10^{17}$ kg / m3 - density of nucleons, constant for all atoms.

m - the mass of nucleons in the body

Substituting (6) into (5) we get:

$$F_g = \frac{m}{\rho_n} \times \rho \times \frac{v_e^2}{r} = 10^{-28} \times m \times \frac{v_e^2}{r} \quad (7)$$

In aerodynamics, the dependence of pressure in a gas (ether) P on its velocity w is represented by the equation:

$$P(r) = P_0 + \rho\cdot w_1^2 \cdot r_1^3 \cdot \left[\frac{1}{r_1} - \frac{1}{r}\right] \quad (8)$$

where

P_0 - the ether pressure at the surface

Using the boundary condition $P(\infty) = P_b$, we find that

$$P_0 = P_b - \rho\cdot w_1^2 \cdot r_1^2$$

P_b- free ether pressure. In fig. 2 graphically illustrates the pressure distribution according to formula (8).

In accordance with the laws of ether dynamics, [9] in the free state of ether (at rest) has a pressure of $P_b = 2.10^{32}$.

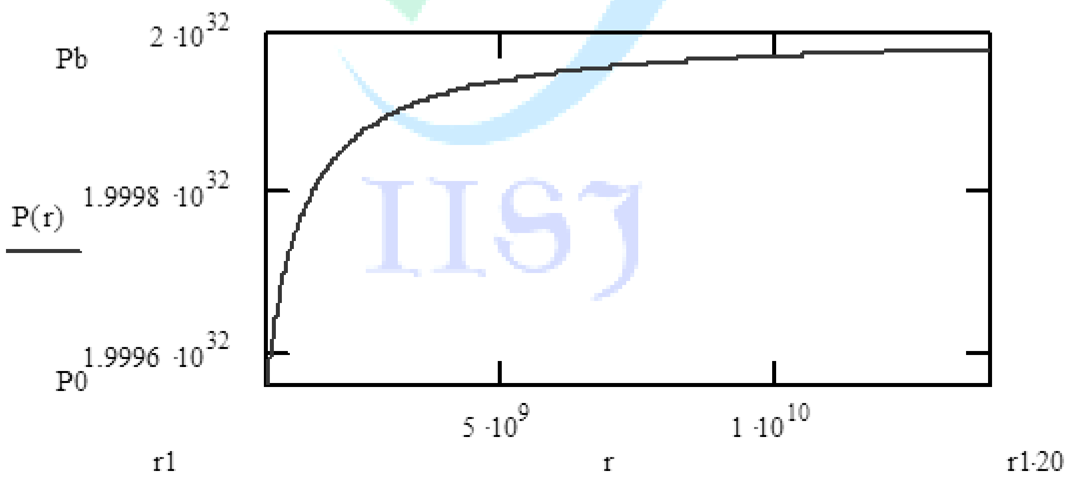

Figure 2: Radial distribution of pressure in the ether torsion

Note 1. Using the vortex gravity equation (7), it is possible to calculate the gravitational forces that act only in the plane of the torsion or in its center. These equations are reliable for calculating the forces of gravity both above the surface and inside celestial bodies. To determine the attractive forces in remote orbits of torsions, the author's article "Gravitation - flat power field" [10] presents the calculation of the gravity equation in a three-dimensional model.

Note 2 Ether consists of super small particles - amers, which freely penetrate any substance, except super dense bodies - nucleons.

Determination of the Mass of Heavenly Body

The mass (M) of any is determined by multiplying its volume (V) by its density (ρ).

$$M = V \times \rho \quad (9)$$

The density of a substance is directly proportional to the force of compression that acts on this substance. Celestial bodies are compressed by static pressure under the influence of the forces of their own gravity. Based on the law of world attraction (Newton), it is assumed that in the center of the planets or stars the gravitational force decreases to zero. The density in the upper layers (in the crust) of our planet is known, it is 2200-2900 kg/m^3. When immersed, it increases. In the center, in the core of the Earth, the density was assumed to be 1.31 x 104 kg/m^3 [3] [11]. The classical values of the density of the nuclei of celestial bodies raise great doubts. Static (technical) pressure in the center of the Earth in modern science is calculated to be 3.7 x 10^{10} kgs/m^2 [12]. That is, the pressure in the center of the Earth increases a million times, and the density of a substance increases only by one order of magnitude compared with the surface layer of the earth. This discrepancy arises from the fact that the usual physical laws are trying to combine with the unproven, empirical equation of universal gravity. Newton's equation obliges researchers to accept the Earth’s average density of 5,500 kg/m3. At other density values there will be another mass of the Earth, which does not correspond to Newton's equation. According to the theory of vortex gravity, the forces of attraction are not created by bodies. Therefore, the gravitational force of a celestial body does not depend on the mass of this body. The density and mass of celestial bodies can be calculated using the classical, physical laws - the more strongly the substance is compressed, the denser it is. The force of compression of the substance of celestial bodies creates only the force of gravity. Since the force of gravity increases towards the center of the torsion (the planet), the density of matter must also increase in proportion to the force of compression. Based on the theory of vortex gravity, vortex flows rotate not only above the surface of planets or stars, but also inside celestial bodies. Therefore, inside a celestial body, gravitational force increases along the same dependence as above the surface of this body. That is, inversely proportional to the square of the distance to the center of the celestial body. In the earth's crust, rocks were formed not on the surface of the planet, but inside the earth's body. As a result of excessive pressure, the molten earth masses were squeezed, through the vents of volcanoes, onto the surface of the Earth [13]. Hardened lava formed the lithosphere on the outer layers of the Earth. The cooled lithosphere is a hard rock. It has a stable crystalline structure and can withstand the pressure of the overlying layers without compaction, to a certain depth. With an increase in the depth of the earth layers, the pressure on these layers increases. There is a destruction of bonds in crystals and atoms approach each other. In this pressure range, synthesis of new materials is possible. They are stable under normal conditions, with new properties. Example: - at a depth of 30 kilometers, silicon oxide - a quartz mineral with a density of 2650 kg/m^3 under a powerful pressure lying above the thickness turns into a denser modification of silicon oxide - with a density of 2910 kg/m^3, - graphite with a density of 2230 kg/m^3, under a high pressure of 10^8 kg/m2, is converted into diamond, with a density of 3510 kg/m^3. Thus, to change the structure of a substance during compression, the condition must be met - the force applied to it must exceed the strength of the interatomic bonds of the molecules or the strength of the crystal lattice. The result is the complete destruction of crystalline and interatomic bonds and the transition of a substance into an amorphous state. Then the substance will consist of individual atoms. With a further increase in the depth of deposition, the interatomic space in the compressed planetary substance will be reduced to a minimum. Atoms are touching. The substance is converted into plasma. The temperature of the substance rises. The density of a substance grows and reaches such values when not only atoms, but also the nuclei of these atoms get closer. In the center of the planet (stars) they merge into a single nucleus, with a maximum density equal to the density of nucleons $\rho_i = 10^{17}$ kg/m3. Based on the above, for calculating the density of terrestrial rocks should adopt the following scheme: - in the earth's crust (h_l ~ 30 km) the density of the earth's substance is constant and does not exceed ρ_0 ~ 2650 kg / m3, - the pressure force at the depth hl has the value P = 2650 x 3 x 104 x 9.8 = 7.8 x 10^8 n/m^2- below the mark of 30 km the terrestrial substance is in the form of magma without crystalline bonds. Each underlying layer becomes denser under the influence of: - static pressure from the overlying layers (inversely proportional to the distance to the center of the planet),- terrestrial, vortex gravity (inversely proportional to the square of the distance to the center of the Earth).

Consequently, the density of terrestrial matter increases in cubic dependence on the depth of the deposit. This dependence can be represented by the equation:

$$\rho_i = \rho_0 \times \left(\frac{r_e}{r_i}\right)^3 \qquad (10)$$

where

ρ_i is the density at the investigated depth,

ρ_0 = 2650 kg / m^3 - the maximum density of the crust,

r_e - radius of a celestial body (Earth)

r_i - distance from the center of the celestial body to the reservoir under study.

Based on equations (9) and (10), we determine the masses of the Earth, the Sun and the Moon

To find the mass, we integrate over the radius of the planet with partial sums in the form:

$$dV = 4\pi r^2$$

$$d\rho = \rho_0 \left(\frac{r_e}{r}\right)^3 \text{ at}$$

$$r_n < r < r_e$$

where

r_n is the radius of the core of a celestial body

Then the mass is calculated by equation (11) the integral will look like this:

$$m_v = \int_{r_n}^{r_e} \rho_0 \left(\frac{r_e}{r}\right)^3 4\pi r^2\, dr = \rho_0 {r_e}^3 4\pi \int_{r_n}^{r_e} \frac{1}{r} dr = \rho_0 {r_e}^3 4\pi \left(\ln\left(\frac{r_e}{r_n}\right)\right) \quad (11)$$

In equation (11) does not take into account the mass of the nucleus of celestial bodies. The density of the nuclei of celestial bodies is constant and it is equal to $\rho_i = 10^{17}$ kg/m^3. The masses of these nuclei are defined as the product of the volume of the nuclei and the density. The radius of the nuclei is determined from equation (10) by substituting the value $\rho_i = 10^{17}$ kg/m^3, $\rho_0 = 2.65 \times 10^3$ kg/m^3 and the radius of the celestial body re into it. Then the radius of the core (rn) will be equal to:

$$r_n = r_i$$

The masses of nuclei are added to the masses of the corresponding celestial bodies in table 1

Table 1: Physical characteristics of celestial bodies

object	r_n (m)	m_v (kg)	m_c (kg)	ρ_v (kg/m^3)	ρ_c (kg/m^3)
Earth	190	$9{,}05 * 10^{25}$	$6{,}0 * 10^{24}$	8200	5500
Moon	210	$3{,}23 * 10^{24}$	$7{,}4 * 10^{22}$	15000	3340
Sun	$2{,}1 * 10^4$	$1{,}22 * 10^{32}$	$2{,}0 * 10^{30}$	8500	1410

mc, ρ_c - generally accepted masses and densities of celestial bodies,

mv, ρ_v - mass and density of bodies according to the calculation (equation 11) ,.

The density of terrestrial matter at a depth equal to half the radius of the Earth with $r_i = 3{,}2 \times 10^6$ m is equal to:

$$\rho_i = 21200 \text{ кг/м}^3$$

Conclusion

Based on the theory of vortex gravity and cosmology, the masses of celestial bodies are determined by 1 - 2 orders of magnitude more than the classical values. According to the proposed methodology, any specialist can calculate the masses of any celestial bodies.

References

1) *Newton, Sir Isaac (1729). The Mathematical Principles of Natural Philosophy, Volume II*
2) «2016 Selected Astronomical Constants» // *The Astronomical Almanac Online*, USNO–UKHO.
3) The Interior of the Earth. USGS
4) Albert Einstein. «Die Feldgleichungen der Gravitation». *Sitzungsberichte der Preussischen Akademie der Wissenschaften zu Berlin*: 844—847.
5) *Field, J. V.* Kepler's geometrical cosmology. Chicago: Chicago University Press, 1988, ISBN 0-226-24823-2, Chapter IV.
6) The Sun's Vital Statistics. Stanford Solar Center. Проверено 29 июля 2008. Архивировано
7) Saturn Fact Sheet
8) S. Orlov. Foundation of vortex gravitation, cosmology and cosmogony. Global journal of science Frontier V A
9) A Atsurovskiy. *General ether-dynamics*. Energoatomizdat. Moscow, Russia. 1990
10) S. Orlov. Research Article of American Journal of Engineering Research and Reviews - https://escipub.com/ajoerr-2018-10-0201/
11) Eugene C. Robertson (January 2011). «The Interior of the earth». United States Geological Survey.
12) https://ru.wikipedia.org/wiki/
13) S. Orlov Genesis of the planet Earth Publishing house SciPress Ltd. https://www.scipress.com/ETET.5.1