

Measuring gravitational waves parameters and the mechanism of the formation of different bodies.

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The parameters of gravitational waves generated by different bodies in the Solar System and in the centre of the Milky Way galaxy have been found. The mechanism of forming «axis of evil», nebulas, conglomerates of galaxies, star, planets, planetary rings, planetary satellites, rings of planetary satellites, dwarf planets, satellites of dwarf planets, asteroids, satellites of asteroids comets, atomic nuclei and other bodies has been explained.

The key words: body, mass, gravitational field constant, gravitational waves, gravitational waves parameters.

I INTRODUCTION.

The people of Babylonian imagined to themselves the Earth in the form of a convex vault the basement of which is immersed into the water of the Tigris and the Euphrates and surrounded by “the Great Dam of the Skies” which supported the sky dome.

In the opinion of Egyptian priests the country of the God Rah is there in the centre where the Earth bends in order to prepare a worthy bed for the Nile.

Indian Brahmins asserted that the Earth is supported on four elephants with their heads directed to the sides of the world and standing on a tortoise and floating in a milk sea.

There were people who considered that the sky and celestial bodies were to support themselves on the shoulders of mighty heroes Atlants in order not to fall down.

Phales of Milet suggested that the Universe consisted of a flat disk of the Earth surrounded by an ocean and placed into celestial sphere rotating round fixed poles and caring fixed stars.

Anaksimandr asserted that the Earth had the form of a cylinder and is situated in the centre of the world.

Pythagoras of Samos assumed that the spherical and rotating Earth moved round the central fire.

Phololai of Croton (530 B.C.) assumed that the central fire, the hearth of the Universe is situated in the centre of the creation and all the planets, the Sun and the Moon being looked after by the goddess Hestia rotated round it.

Plato in his work “Republic” using the form of allegoric myth and in poetical description in “Tymea” asserted that

the Moon, the Sun, the morning star Venus, the star of Hermes (Mercury), the star of Ares (Mars), the star of Seus (Jupiter), the star of Chronos (Saturn) rotated along circular orbits round the motionless Earth.

Eudox of Knede assumed that every planet had several spheres connected with each other.

Eudox of Knede reduced all the visible motions of celestial bodies to the rotation of thirty-three concentric spheres rotating round the motionless Earth.

Aristotle in his works “About the Sky” and “Meteorology” asserted that the Earth is ball-shaped and is situated in the centre of the Universe. The stars and planets were connected with crystal spheres rotating round the common centre. The outer star sphere was directly regulated by the divine engine.

Titus Lucrece Car in his work “On the nature of things” asserted that the universe is vacuum having no centre and uniformly filled with absolutely hard, indivisible and understroyable particles of matter flying away in all directions.

Claudius Ptolemy in his work “Almagest” (150 B.C.) elaborated a geocentric system according to which each planet moved along a smaller circumference or epicycle the centre of which moved along a larger circumference round the Earth.

The geocentric system was criticized because it was cumbersome and complicated.

N. Kues (N. Crebs) in his work “About scientific not knowing” published posthumously proclaimed that the Universe was unlimited as otherwise it would be necessary

to assume something that followed beyond its limits which in its turn would contradict to the definition of the Universe as including everything that existed. He asserted that the earth, the Sun or any other body couldn't be the centre the Universe that had its centre "everywhere" and its body "nowhere".

N. Copernic placed the Sun in the centre of the Universe, planets, the Earth and the Moon among them, moving round it. The sphere of stars is situated at a long distance from the system of planets.

Heliocentric system was criticized for being cumbersome and complicated.

In 1584 G. Bruno in his works "On reason, starting point and unified" and "On the Infinity of the Universe and the worlds" asserted that the Sun wasn't the motionless centre of the Universe, because the Universe was infinite and any star might be such a centre.

In 1588 T. Brahe placed the motionless Earth in the centre of the Universe, the Moon and the Sun rotated round it and other planets rotated round the sun.

J. Kepler suggested that stars were formed from thin matter of the Milky Way.

Galileo Galilei asserted that planets move from force of inertia along circular orbits.

R. Descartes put forward a hypothesis of whirlwinds according to which the space of the Universe is filled with a special light movable substance, generating gigantic whirlwinds.

The whirlwinds carry away and set in motion all the surrounding bodies.

The whirlwinds surrounding the Sun sets in motion all the planets and their satellites. The whirlwind surrounding the Earth, sets the Moon in motion.

R. Descartes whirlwind theory was criticized for its inability to explain the motion of planets by J. Kepler laws.

I. Newton asserted that stars were remote heavenly bodies like the Sun that appeared in the result of the condensation of the substance that initially "uniformly filled infinite space".

In 1696 W. Whiston in his work "The new theory of the Earth" assumed that the Earth was originally a comet

moving round the Sun which having collided with another comet started rotating round it's axis.

In 1729 E. Swedenborg in his work "On the Principles of Nature" and in 1734 in "the works in Philosophy and Mineralogy" assumed that planets were formed in the result of the origin of matter whirlwind in the Sun; this whirlwind became wider while accelerating under the action of centrifugal forces.

E. Swedenborg was criticized because his hypothesis contradicts the laws of mechanics.

In 1750 T. Right in his work "An original theory or a new hypothesis of the Universe based on the laws of nature and explaining by means of mathematical principles the most important phenomena of the visible world, the Milky Way in particular" asserted that the Milky Way, as we see it, is accounted for by the fact that all stars "move similarly [along circular orbits round a remote centre] and don't decline too far from a certain plane like planets in their motion round the Sun".

The hypothesis of insular Universe was criticized because star system is a hollow spherical shell but not a disk.

In 1749 G. Buffon in his works "History and theory of the Earth" and in 1778 in his work "Epochs of Nature" put forward the idea of natural origin and development of the Solar system within the frames of gravitation theory of J. Newton by replacing a hand of the God by a natural impulse of a comet. According to this hypothesis planets were formed in the result of a slanting comet stroke as a cannon ball into the motionless liquid Sun along a line tangent to the surface.

G. Buffon hypothesis was criticized because the Sun wasn't liquid and comets didn't resemble cannon balls. The substance thrown away from the Sun was to fall on it again but not to move along circular orbits. Besides it is difficult to explain the origin of planetary system as a rare and almost occasional event.

In 1761 J. Lambert in his work "Cosmological letters about the mechanism of the Universe" put forward the idea of hierarchic structure of the Universe.

In 1772 J. Lagrange in his work "On the problem of three bodies" found out that besides three collinear equilibrium points three existed two triangular points

(Lagranges points) where a body of a small mass could be in equilibrium to the other two bodies.

In 1907 the asteroid called Achilles was discovered in Heidelberg and its orbit practically coincided with the orbit of Jupiter. The question about the reason that made Achilles move from the asteroid belt to Jupiter orbit appeared at once.

The “Trojans” were situated in two Lagranges points L_4 and L_5 , out of five, and were the vertices of equilateral triangles while the Sun and Jupiter were situated in the other two vertices.

Besides Jupiter Trojans there are also Trojans of Mars and Neptune.

At present the problem of general solution of three bodies, except one particular case, has no solution.

J. Lagranges was criticized because his calculations described the motion of the Greeks and the Trojans but didn't explain the mechanism of such a motion.

In the 1920th – 1930th F. Zander and Y. Kondratyuk were the first to suggest using gravitational maneuver. It is considered that gravitational maneuver was first performed by the American station Mariner -10 in 1974 while heading to Mercury passed Venus at a close distance. Various interplanetary probes (“Pioneer -10”, “Pioneer-11”, “Voyager 1”, “Voyager 2”, “Uliss”, “New Horizons”) used gravity acceleration of Jupiter for gathering speed.

In Lagranges points, L_1 and L_2 an interplanetary probe may be in the space without any fuel consumption. Thus, for example, a solar observatory SOHO works in L_1 while astrophysical WMAP is in L_2 and 6-metre telescope named after James Webb is going to be sent there.

In 1775 I. Kant in his work “The Universal natural history of the sky or the study of the structure and mechanical origin of the Universe based on Newtons principles” assumed that planets and the Sun originated from a rotating nebula that occupied all the space in the Solar system.

The hypothesis of I. Kant was criticized because of the assumption that first matter had no motion and because the formation of planets contradicted the law of conservation of angular momentum.

In 1784 W. Herschel put forward the hypothesis about gradual thickening of diffusion matter into separate stars, their groups and later on into concentrations.

In 1796 P.S.Laplace in the work “The Exposition of the world system” assumed that the Sun, planets and satellites originated from the slow rotating nebula consisting of rarified white-hot gas.

P.S. Laplace hypothesis was criticized as it didn't properly ground the distribution of angular momentum in the Solar system; inverse rotation of Venus, Uranus and some satellites quick rotation of Phobos and Deimos round Mars and the rotation of Saturn rings round Saturn; variety of the orbits of comets and asteroids.

In 1845 W. Parsons (Lord Ross) having built in his estate Bear Castle a telescope (“Leviathan Parsonstown”) with the diameter of its looking-glass objective equal to seventy-two inches (18cm) and with focal distance of seventeen meters suspended between two 15 meters long walls made of bricks and stones with the total mass more than 150 tons and with the cost of 12.000 pounds when observing one of the nebulas in the constellation of the Hunting Dogs (M51 GC 5194 “Whirlpool”) discovered spiral hoses of galaxies as two indistinct pale strips coming out from the central thickening and whirling to one side along the spiral.

It was supposed that the spiral lines during ten billion years of galaxy rotation were to wind round the centre for many dozens times like a thread round a reel. However, in reality spiral branches whirl round galaxy centre only several times. It shows that spiral structure is a stable process.

In 1849 E. Roche assumed that a satellite can't rotate at the distance from the central body which is less than “Roche limit”.

E. Roche asserted that the Saturn ring was a former satellite that happened to reach the planet and “was torn to peaces” by its gravitation forces.

In 1857 D. Kirkwood discovered the existence of “downfalls” in the distribution of average distances from the Sun to asteroids that corresponded to the periods of the rotation round the Sun divisible without remainder to the period of rotation of Jupiter.

D. Kirkwood criticized nebular hypothesis of P.Laplace for its inability to explain many properties of the Solar system.

In 1879 Ch. Darwin suggested a resonance theory according to which the Earth and the Moon were formed in the result of division of a large pear-shaped celestial body scorching to liquid state, and moving along the Earth orbit due to the instability caused by resonance Sun rising tides.

G. Darwin's theory was criticized for its insufficient groundation of the stability of pear-shaped figure.

In 1884 H. Fayy in his work "About the origin of the world" assumed that planets were formed in the external parts of a cloud whirlwind of the primordial matter and later on the matter thickened into the Sun in the centre of space tornado.

C.Brown assumed that massive thickening in protoplanetary cloud hit against central thickening (proto-sun) in the result of which the external layers of the Sun atmosphere and later on the central layers started rotating.

C. Brown's hypothesis was criticized for insignificant chance of the collision of thickenings.

In 1900 W. Strutt (Rayleigh) and in 1950 G. Taylor assumed that the formation of large gaseous and dust complexes in our galaxy and in other ones may be regarded as the result of the growth of small pressure, density and velocity deviations from balanced values in gaseous and liquid medium with non-uniform distribution of density located in gravitation field or moving with acceleration.

In 1908 S.Arrhenius assumed that the Solar system was formed from the substance of two jets that appered in the result of the frontal collision of two stars the cooled hard crust of which was destroyed at that collision.

This hypothesis of S. Arrhenius was criticized for nearly zero probability of the collision of two stars.

In 1900 F.R. Moulton and T.C. Chamberlin suggested "planetesimal hypothesis" of the origin of the Solar system according to which planets and satellites were formed from small hard particples (planetesimal) that appeared in the result of hardening of the substance thrown away by the Sun in the form of huge solar prominences when some star was passing the Sun at a close distance.

The hypothesis of F.R. Moulton and T.C. Chamberlain was criticized because the formation of planetisimals contradicted the law of conservation of angular momentum (moment of momentum).

In 1908 (and later on in 1922) K. Sharlier suggested his theory of hierarchic Universe according to which the Universe is an infinite concentration of systems including each other of the increasing order of complexity.

In 1916 A. Einstein in his work "Approximate integration of gravitation field equations" suggested gravitational waves theory according to which there must exist gravitational waves not carrying energy and propagating at the velocity of light. It is assumed that any moving bodies are the source of gravitational waves. Some specialists assert that any motionless or moving with acceleration body can't generate gravitational waves.

The Gravitational wave is understood now as a perturbation of gravitation field that can spread in space autonomously at finite velocity and carry energy.

The Gravitational wave forms a thickening in the distribution of bodies and passes from some bodies to others creating the thickening in other places and from new bodies.

The Gravitational waves interact with bodies much weaker than electromagnetic waves. The mass of a body plays the role of a charge under gravitational interaction.

Though nobody has managed to find out gravitational waves from the analysis of Einstein equations yet one can suppose their properties as follows:

1. The Gravitational waves spread at velocity of light.
2. The Gravitation waves must be transverse and exert force on the bodies in the plane perpendicular to the direction of their spreading. However, similarly to electromagnetic waves gravitational waves can be flat, cylindrical and spherical.
3. The Gravitational waves interact with any masses they come across on their way.
4. The Gravitational wave is characterized by length and frequency.

The Gravitation waves are generated by any moving bodies.

According to the existing models of inflation in the theory of strings gravitational waves in the form of ripple on the substance of space-time are invisible due to their weakness.

The difficulties in discovering gravitational waves are accounted for a considerable wave length and insufficient efficiency of radiators. It is supposed that obtaining gravitational waves must lead to their energy transformation into other kinds of energy or to the change of the motion of separate bodies and their concentrations under the action of gravitational waves.

The fact that gravitational waves haven't been discovered yet is explained by the weakness of laboratory sources of gravitational radiation, sufficient distance to cosmic sources, insufficient perfection of detectors and other reasons.

At the same time such an important source of gravitational waves as the Sun which is situated in the zone of the direct optical visibility has been completely neglected.

At present many specialists try to register gravitational waves with the help of resonance, spherical and laser detectors.

Moreover it is stated that the greatest power of gravitation must come from the objects situated far beyond the limits not only of the Solar system, but also of the Milky Way Galaxy: double stars, star collisions, sharp change of their radius, explosions of super nova, etc.

At the same time, some specialists consider that the Sun has insufficiently high density for effective generating gravitational waves.

In 1922 A. Friedmann and in 1927 G. Lemaitre found a solution of A. Einstein gravitational field equations that characterize the expanding Universe.

The great explosion theory was put forward before obtaining any data proving the universe expanding.

The model of the Great explosion was criticized for inadequate groundation of the balance of the Universe expansion by gravitational attraction of galaxies; the process of formation of galaxies, the same temperature of the cosmic microwave radiation in the whole Universe.

In 1926 B. Lindblad suggested the conception of the rotation of a galaxy to explain asymmetry in the distribution of stars velocities in the Milky Way galaxy.

In the 20s – 30s of the twentieth century J.H. Jeans put forward his theory of tides; according to this theory planets were formed from the substance which was extracted from the Sun by gravitational attraction of a planet passing at a close distance.

In 1928 J. H. Jeans asserted that: "While spiral branches are unexplained it is impossible to trust any suggestions and hypotheses connected with other peculiarities of nebulae [galaxies] which seem to be explained much easier. Each unsuccessful attempt to explain the origin of spiral branches makes it more difficult to resist the suggestion that spiral branches are the sphere of action of forces absolutely unknown to us and reflecting, maybe, new metric properties of space that we didn't even suspect about. The suggestion that the centers of nebulae have the nature of singularity points in which some substance gets into our Universe from other unknown to us space dimensions which function in our Universe as points where continuous formation of substance takes place? Consistently declare about themselves

The hypothesis of J.H. Jeans was criticized for insufficient groundation of the process of the formation of planets, satellites, comets and asteroids; the rotation of planets and satellites round the axis; the distribution of planets round the Sun; the existence of numerous planetary systems and the distribution of angular momentum in the Solar system.

In 1929 H. Jeffreys trying to improve the theory of J.H. Jeans assumed that planets were formed from the substance torn out from the Sun in the result of a sliding sidelong collision with a star. The hypothesis of H. Jeffreys was criticized for insufficient groundation of the distribution of angular momentum per one ton, large dimensions of the Solar system, the parallelism of the Sun and the star orbits.

Later on H. Jeffreys rejected his own hypothesis in public.

In 1929 E. Hubble stated the dependence between the velocity of moving off extra-galaxy sources caused by the Universe expansion and the distance to them (Hubble law),

the comparison of the distance to galaxies and their red displacements.

In 1934 B. Lindblad suggested his hypothesis about gradual growth of the particles of interstar dust due to accretion (cold sticking together of particles or their absorption by a larger body).

In 1939 H. Alfven suggested the theory of magnetic storms and northern lights based on the conception of magnetic fields “infrozen” into plasma.

The theory of magnetic storms and northern lights of H. Alfven was criticized because in case the atoms of the lightest elements were to be ionized closer to the Sun and the atoms of heavy elements were to ionize further from it, then the planets situated closer to the Sun must also consist of hydrogen, helium and other light elements while distant planets must consist of iron and nickel.

In 1943 C.F. Weizsacker suggested the theory of turbulence.

Turbulence theory of C.F. Weizsacker was criticized because vortices and small eddies can't exist long enough for planets to be formed.

In 1943 O. Schmidt assumed that planets were formed from a swarm of cold solid bodies and particles caught by the Sun gravity.

The hypothesis of O.Schmidt was criticized for its inability to explain catching a nebula only by the Sun; slow rotation of the Sun around its axis; the distribution of planets according to distances and the motion of some satellites and asteroids almost perpendicularly to ecliptic plane.

In 1944 F.Hoyle put forward his hypothesis of planetary formation from hot star substance.

In 1956 G.P. Kuiper suggested a protoplanetary “solar” hypothesis according to which the Sun and stars were formed from a proto-star that decreased its initial volume by nearly one the millionth part.

G.P. Kuiper asserted that Saturn ring is the remainder of a nebular disk that surrounded this planet at the time of its formation. The origin of satellites is similar to the origin of planets.

In 1960 F. Hoyle put forward his hypothesis of the formation of planets from cold star substance according to which the transfer of angular momentum from the Sun to

planets was accomplished by means of electromagnetic forces.

F. Hoyle hypothesis was criticized because any durable magnetic cohesion was impossible due to instability of plasma.

In 1960 E.J. Opik assumed that planets were formed from a nebula rotating around the Sun.

The hypothesis of J. Opik was criticized for its inability to explain volcanic activity on the Moon.

In 1964 Ling Tzya-Tzyao and F. Shoe assumed that a spiral structure is a density wave spreading along galaxy disk.

Ling Tzya-Tzyao assumed that spiral hoses appear under the action of some spiral component that forms density waves which in their turn make gas and stars accumulate along the minimal potential line. Gas and stars are retained rather in spiral “potential” pockets than between them. Spiral hoses don't retain the same bodies for a long time but are renovated all the time.

In the 70th of the twentieth century W.G Tiffet, S.A.Gregory and G.Chincarini found out with the help of planetary spatial distribution analysis using red displacement, that galaxies and their accumulations gather not in the foam bubbles but the bubbles partitions.

The data obtained by the probe NASA Wilkinson Microwave Anisotropy Probe (WMAP) brought to the outer space by the carrier rocket Delta II in June 30, 2001 show that “cold” and “warm” regions in the sky are placed in some order but not in chaos.

In 2005 K. Lend at Oxford University was the first to pay attention to the unusual distribution of temperature fluctuations of relict electromagnetic radiation in the celestial sphere [3,4].

J. Magueijo from London Imperial-college called this axis of symmetry the “axis of evil” because it casts a shadow of doubt on all the modern ideas about the origin of the Universe and its development, Einstein's relativity theory being among them.

R. Scarpa from European Southern observatory in Chile asserts with groundation that as soon as the base model of the Great explosion can't explain the Universe temperature,

its expansion and the existence of galaxies, a new essence-inflation, dark matter and dark energy is introduced into it.

In 2004 the specialists from Minnesota University under the guidance of L. Rudnick having analyzed the data of the sky observation NRAO VLA Sky Survey (NVSS) obtained with the help radio telescopes Very Large Array (VLA), discovered a dark cold spot 280 M-parsecs in size in the cancellation of Eris where the density of galaxies is much less than usual and the temperature of relic radiation is some millionth parts lower than the average one.

II THE STATEMENT OF THE PROBLEM.

While analyzing the results of the research one can mention the following advantages of the work done:

- the discovery of heliocentric system by N. Copernic in 1543;
- the discovery of spiral hoses by W. Parsons (Lord Ross) in 1845;
- the discovery of the “axis of evil” by C.Lend and J.Magueijo in 2005.

Besides the advantages we should mention the following disadvantages of the work done:

- the mechanism of the formation of “axis of evil”, nebulas, galaxies accumulations, galaxies, stars, planets, planetary rings, planetary satellites, planetary satellites rings, dwarf planets, dwarf planets satellites, asteroids, satellites of asteroids, comets, atomic nuclei and other bodies have not been explained;
- the mechanism of winding round of the majority of spiral galaxies clockwise and in the opposite direction hasn't been explained;
- gravitational waves haven't been discovered and their parameters haven't been found;
- the reason for planets being located at define distances from the Sun in accordance with Titius Bode law hasn't been explained;
- the mechanism of the motion of the Greeks and the Trojans along the orbits of Jupiter, Neptune, the Earth and other bodies hasn't been explained;
- the mechanism of the formation of asteroid belts hasn't been explained;

- the mechanism of the formation of Kirkwood astrohatches hasn't been explained;
- the mechanism of reverse rotation of Venus, Uranus, Pluto and other bodies hasn't been explained;
- the mechanism of rapid rotations of planets-giants hasn't been explained.

In connection with the above mentioned facts the tasks of the research are following:

- to explain the mechanism of the formation of the “axis of evil”, nebulas, galaxies accumulations, galaxies, stars, planets, planetary rings, planetary satellites, rings of planetary satellites, dwarf planets, satellites of dwarf planets, asteroids, satellites of asteroids, comets, atomic nuclei and other bodies;
- to explain the mechanism of winding round the majority of spiral galaxies clockwise and in the opposite direction;
- to discover gravitational waves and find their parameters;
- to explain the reason of the location of planets at define distances from the Sun according to Titius-Bode law;
- to explain the mechanism of the motion of the Greeks and the Trojans along the orbits of Jupiter, Neptune, the Earth and other bodies;
- to explain the mechanism of the formation of asteroid belts;
- to explain the mechanism of the formation of Kirkwood hatches;
- to explain the mechanism of the reverse rotation of Venus, Uranus, Pluto and other bodies;
- to explain the mechanism of the rapid rotation of planets-giants.

III. RESULTS.

J. Weber and some other specialists assumed that the simplest way to find gravitational waves is to use different detectors.

However, this method is thought to be the most expensive to our mind. The attempts to transfer the detectors to the outer space where as B. Patchinsky says “dollars weigh less, won't make this method cheaper”.

The gravitational field constants of the centre of Milky Way galaxy, the Sun, planets, dwarf planets and some

asteroids having been found, there were made the attempts to answer the question how the value of the constant in the intervals between the spirals of the Milky Way galaxy, stars, planets, planetary rings, planetary satellites, dwarf planets, satellites of dwarf planets, asteroids and satellites of asteroids will change.

To obtain the necessary data in the intervals between the spirals of the Milky Way galaxy, stars, planets, planetary rings, planetary satellites, dwarf planets, satellites of dwarf planets, asteroids and satellites of asteroids, 1, 2, 4, 10 and 100 virtual bodies have been introduced and medians, quartiles, deciles, and percentiles with regard to every respective interval have been found.

The results are presented in figures 1, 2, 3, 4 and 6. This resulted in obtaining a curve characterizing, in our opinion, gravitational waves generated by the Milky Way galaxy centre, the Sun, planets, dwarf planets and asteroids.

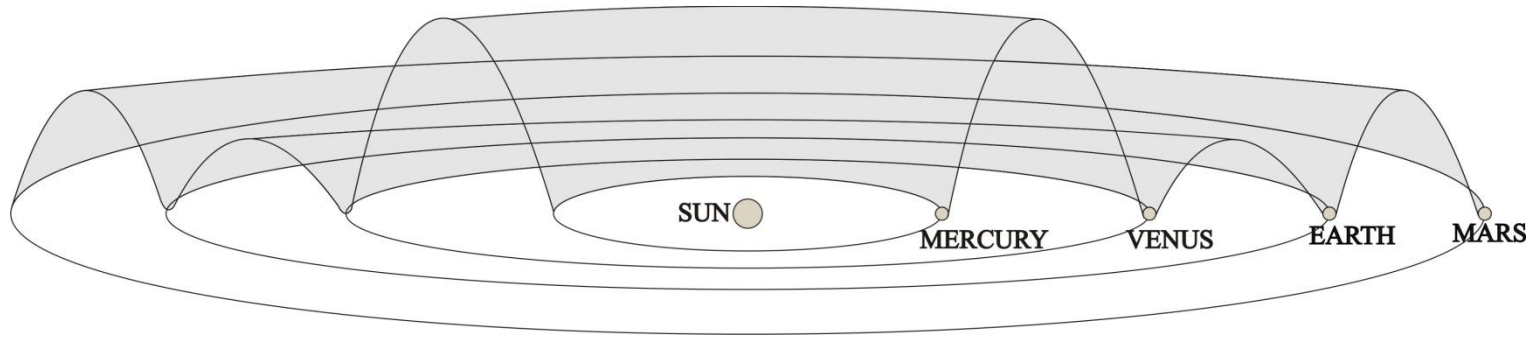


Fig. 1. The gravitational wave generated by the Sun from Mercury to Mars.

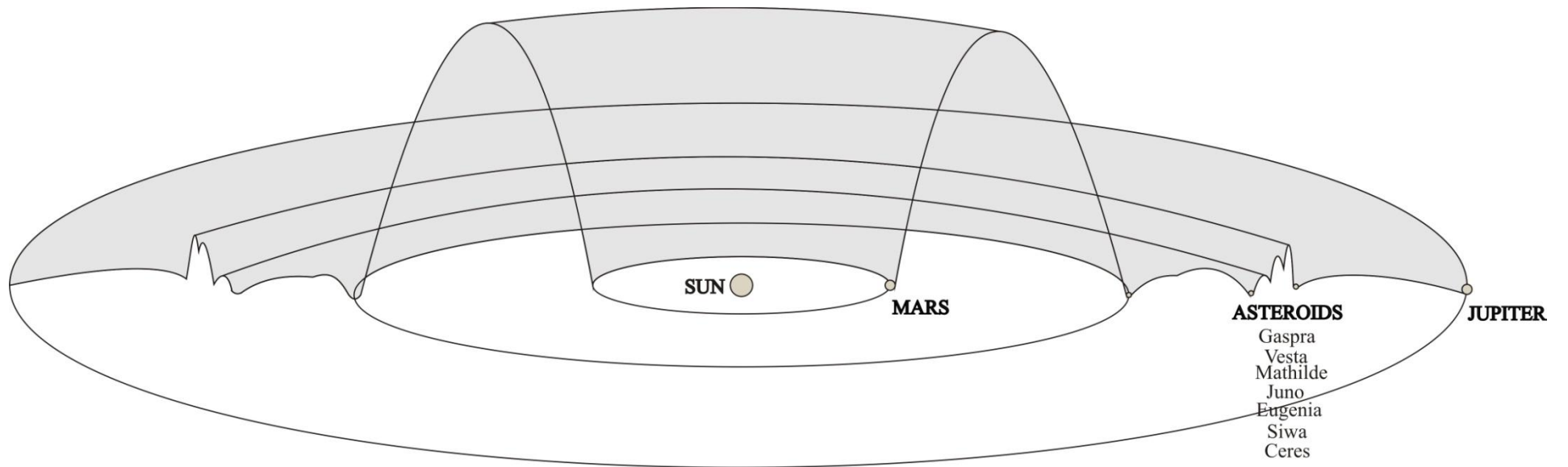


Fig. 2. The gravitational wave generated by the Sun from Mars to Jupiter.

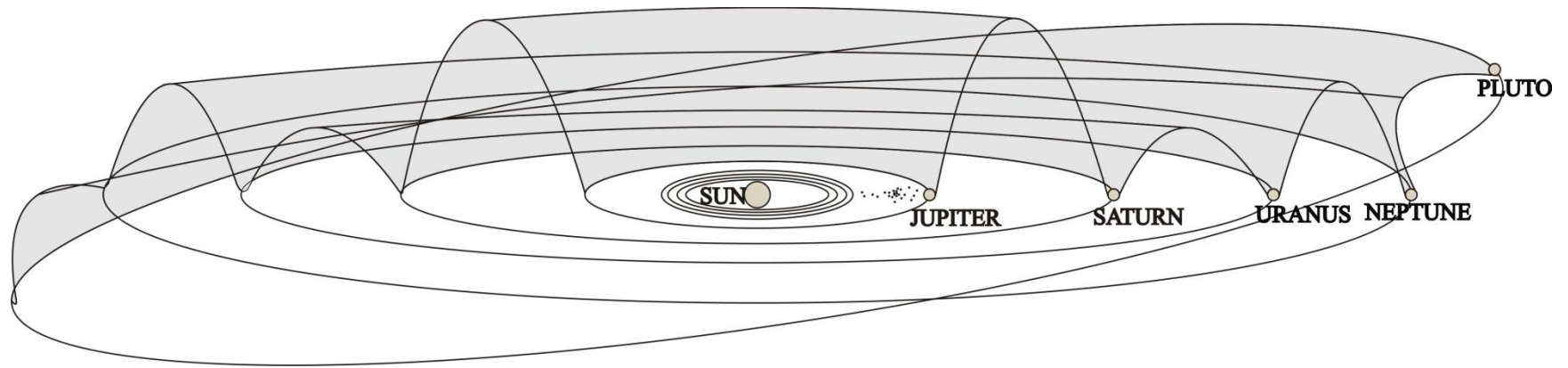


Fig. 3. The gravitational wave generated by the Sun from Jupiter to Pluto.

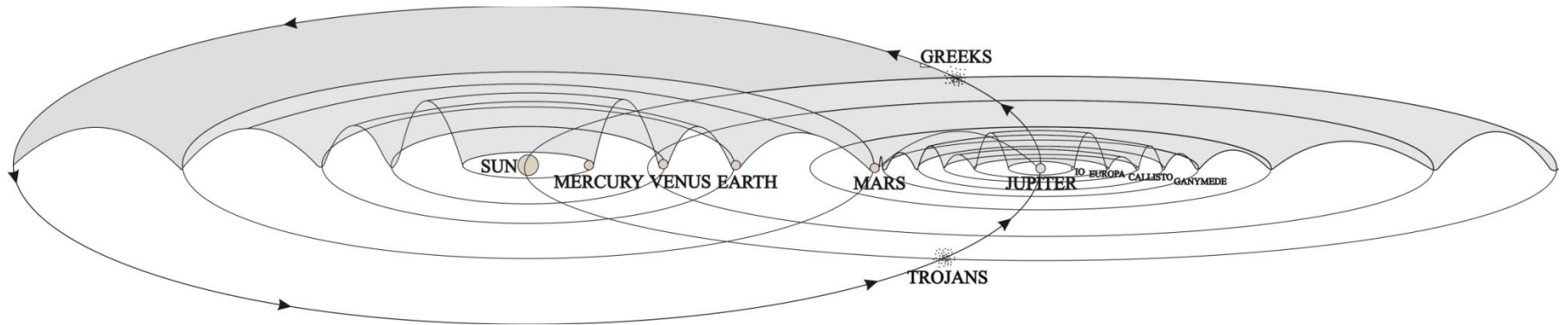


Fig. 4. Interference of the gravitational waves generated by the Sun and Jupiter.

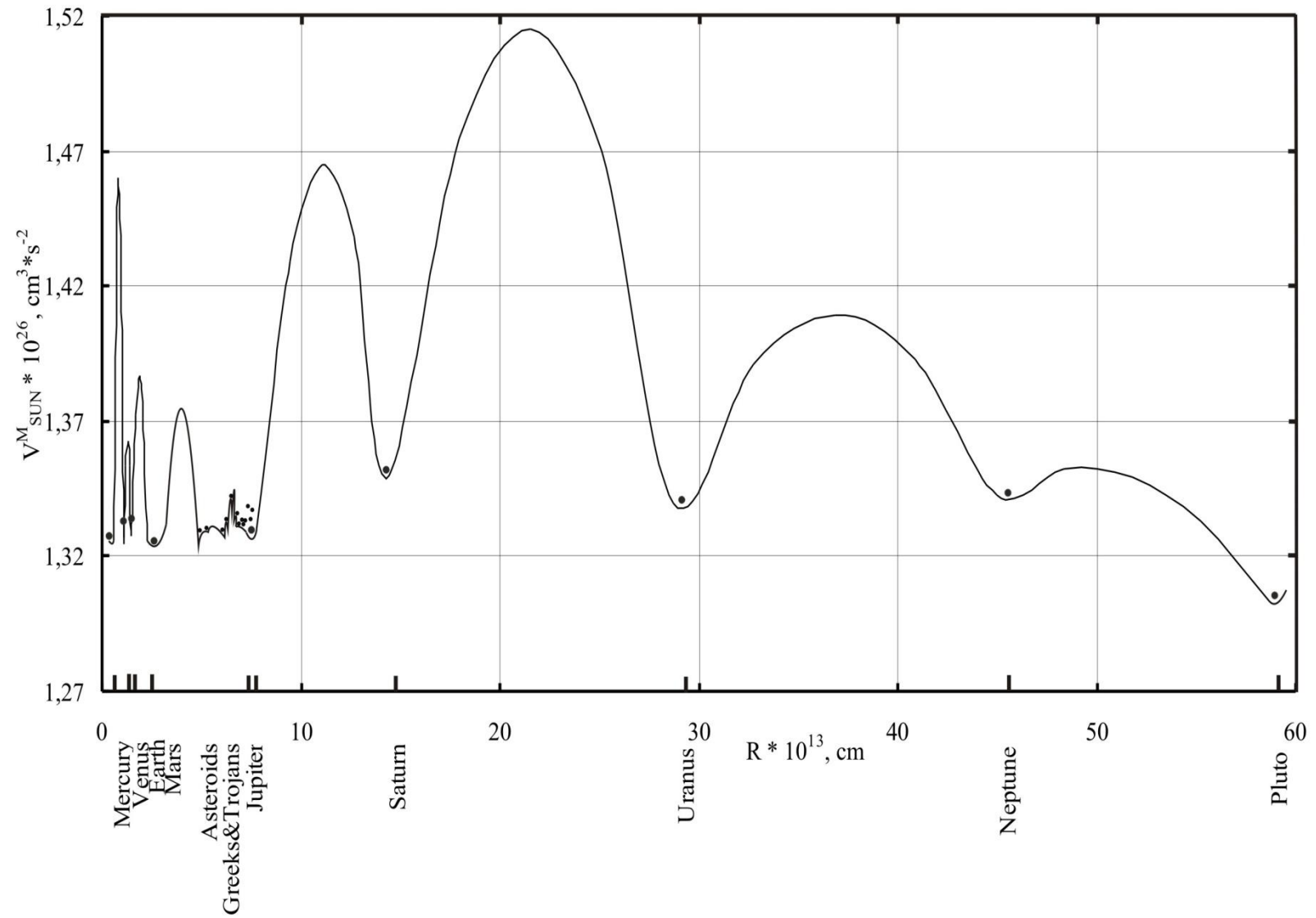


Fig. 5. The gravitational wave generated by the Sun from Mercury to Pluto.

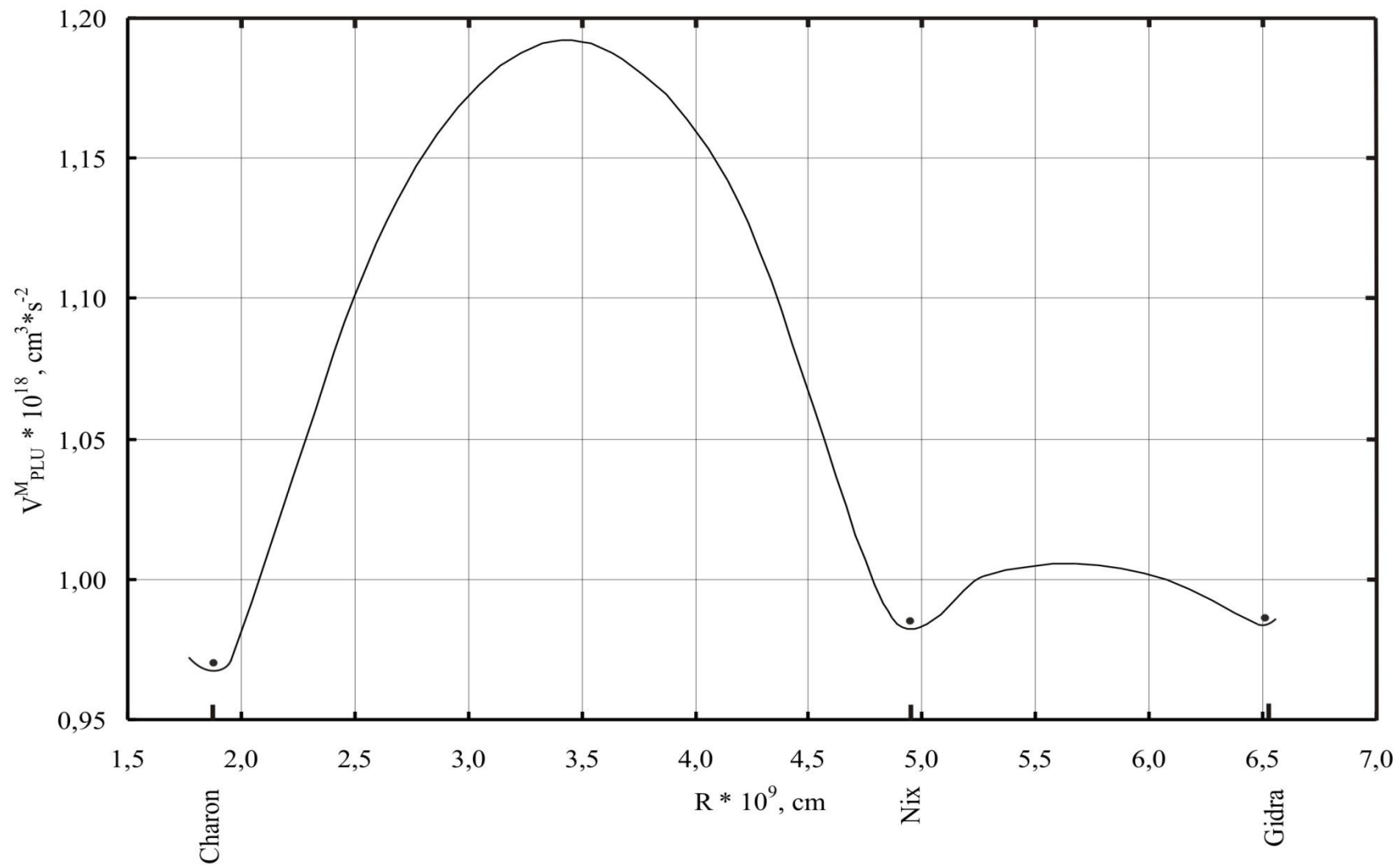


Fig. 6. The gravitational wave generated Pluto from Charon to the Gidra.

The obtained curve between contiguous real bodies has the form of a curve of normal distribution.

It follows from the figure... that in the interval between the spirals of the Milky Way galaxy, stars, planets, planetary rings, planetary satellites, dwarf planets, satellites of dwarf planets, asteroids and other bodies, the gravitational field constant found by the parameters of virtual bodies increases to a certain maximum that occurs in the middle of the interval and later on it decreases.

Moreover, the gravitational field constants found by the parameters of virtual bodies in the middle of the interval between virtual bodies sufficiently exceeds the gravitational field constants found by parameters of these real bodies.

The experiment of representing magnetic force lines by iron filings which, in M. Faradays opinion, helps an investigator “see improbable results at once and obtain a lot of important instructions for future experiments” was taken into account in the process of searching gravitational waves.

The role of iron filings in the gravitational field generated by the “axis of evil” is played by nebulas, galaxies accumulations and galaxies.

The role of iron filings in the gravitational field generated by the centers of galaxies is played by the galaxies with less masses, spirals and stars.

The role of iron filings in the gravitational field generated by stars is played by stars with less masses, planets, asteroids and comets.

The role of iron filings in the gravitational field generated by planets is played by the rings of planets and satellites of planets.

The role of iron filings in the gravitational field generated by dwarf planets is played by the satellites of dwarf planets.

The role of iron filings in the gravitational field generated by asteroids is played by the satellites of asteroids.

The role of iron filings in the gravitational field generated by atomic nuclei is played by electrons.

The creation of gravitational waves generated by the Milky Way galaxy centre, the Sun, planets, dwarf planets and asteroids makes possible to explain the mechanism of the formation of “the axis of evil”, nebulas, galaxies accumulations, galaxies, stars, planets, planetary rings, planetary satellites, rings of planetary satellites, dwarf planets, satellites of dwarf planets, asteroids, satellites of asteroids, comets, atomic nuclei and other bodies.

In the search of gravitational waves it was assumed that no bodies can rotate for a long time without any inflow of energy.

While analyzing the process of forming different bodies it was assumed that the action of gravitational waves is analogical to the action of the wind on the sails of the yachts of different classes.

The process of formation of all the various bodies takes place simultaneously.

The well- known distribution of the galaxies in the Universe obtained in the result of computation on a supercomputer by the model with cold dark matter, from our point view, isn't properly grounded due to the fact that it was obtained on the basis of Newton's doubtful theory of gravitation,

The motion of nebulas, galaxies accumulations and galaxies round “the axis of evil” occurs in the same way as the motion of planets, dwarf planets and asteroids around the Sun.

The shape, volume and density of the Universe are determined by the parameters of the gravitational waves, generated by the “axis of evil”.

The parameters of gravitational waves generated by the “axis of evil” are determined by mass, gravitational field constant, angular velocity of rotation and other parameters of galaxies, black holes and stars located on “the axis of evil”

Nebulas, galaxies accumulations and galaxies were formed in the cavities of the gravitational waves generated by “thee axis of evil”.

Voids are the protuberances of the gravitational waves generated by “the axis of evil”.

The region in the constellation of Eris is the protuberance of a gravitational wave generated by “the axis of evil”.

Nebulas, galaxies accumulations and galaxies being located in the cavities of gravitational waves, it is impossible for these bodies either to reach “the axis of evil” or to go away from it.

Under such conditions the distance from “the axis of evil” to nebulas, accumulations of galaxies and galaxies doesn’t depend on the mass, radius, density and other parameters of these bodies.

The spiral structure of the Universe is the same as the spiral structure of the Milky Way galaxy.

Nebulas, galaxies accumulations and galaxies are set in motion by the gravitational waves generated by “the axis of evil”.

The predominance of the galaxies “wound round” in the direction opposite to clockwise is explained by the fact that the crests of the gravitational waves generated by “the axis of evil” bend around the parts of nebulas, galaxies accumulations, galaxies located on the outer side of the orbit by comparison with those that are “wound round” in the opposite direction.

The motion of galaxies having smaller masses, spirals and stars around the centers of galaxies is the same as the motion of nebulas, galaxies accumulations and galaxies around “the axis of evil”.

The shape, volume and density of galaxies are determined by the parameters of the gravitational waves generated by the centres of galaxies.

The hoses of spiral galaxies contain more young stars because the gravitational waves there making smaller bodies concentrate in the cavities cause the active star formation.

Elliptical galaxies contain less young stars because the gravitational waves don’t form any marked cavities which don’t influence the active star formation.

The parameters of the gravitational waves generated by the centers of galaxies are determined by the mass, gravitational field constant, angular

velocity of rotation and other parameters of black holes and stars located in the centers of galaxies.

The fact that the gravitational field constant of the Milky Way galaxy centre changes with the increase of the distance from the galaxy centre is explained by the finite velocity of the gravitational waves propagation and non-uniformity of the distribution of mass in the galaxy.

The galaxies with smaller masses, spirals and stars were formed in the cavities of gravitational waves generated by the centers of galaxies.

The galaxies with smaller masses, spirals and stars being located in the cavities of gravitational waves, it makes impossible for these bodies neither to reach the centers nor to go away from them.

Under such conditions the distance from the centers of the galaxies with smaller masses, spirals and stars doesn’t depend on the mass, radius, density and other parameters of these bodies.

The spiral structure of spiral, elliptic and irregular galaxies is the same as the spiral structure of the Universe.

The galaxies with smaller masses, spirals and stars are set in motion by the gravitational waves generated by the centers of galaxies.

The predominance of the galaxies with smaller masses, spirals and stars rotating directly round their axis is explained by the fact that the crests of the gravitational waves generated by the centers of galaxies bend around the parts of galaxies with smaller masses, spirals and stars located on the outer orbit as compared to those rotating in the opposite direction.

The motion of stars with smaller masses, planets, dwarf planets and asteroids around stars is the same as the motion of galaxies will smaller masses, spirals and stars around the centers of galaxies.

The shape, volume and density of star systems are determined by the parameters of the gravitational waves, generated by stars.

The parameters of gravitational waves generated by stars are determined by the mass, gravitational

field constant, angular velocity of rotation and other star parameters.

The stars with smaller mass, planets, dwarf planets and asteroids were formed in the cavities of the gravitational waves generated by stars.

The location of planets, dwarf planets and asteroids in the cavities of the gravitational waves makes it impossible for these bodies either to reach the stars or to go away from them.

Under such conditions the distances from stars to stars with smaller mass, planets, dwarf planets and asteroids doesn't depend on the mass, radius, density and other parameters of these bodies.

The location of planets in the cavities of the gravitational waves explains the mechanism of the action of Titius-Bode planetary distances law which doesn't take into account planetary masses.

The existence of an asteroid belt in the interval between Mars and Jupiter is the result of the interference of gravitational waves generated by the Sun and Jupiter.

If a planet the mass of which were comparable to that of Mars were formed on the place of Jupiter in graduation wave cavity than there would be no necessary conditions for the formation of asteroid belt.

The attempts to explain the existence of an asteroid belt by the destruction of hypothetic planet Phaethon is, as we think, groundless.

If Phaethon were formed in the gravitational wave cavity and destroyed later on in the result of collision with another body or due to some other reason then its fragments would again form a planet in some period of time.

The parameters of the gravitational waves generated by the Sun and Jupiter helped to give explanation of the mechanism of the motion of the Greeks and the Trojans along the orbit of Jupiter.

The Trojans and the Greeks turned out to be in the cavities of the gravitational waves generated by the Sun and Jupiter in the points of their intersection on the orbit of Jupiter (see fig. 4,7 and 8).

The interference of the gravitational waves generated by the Sun and Jupiter prevents the Trojans and the Greeks from being displaced.

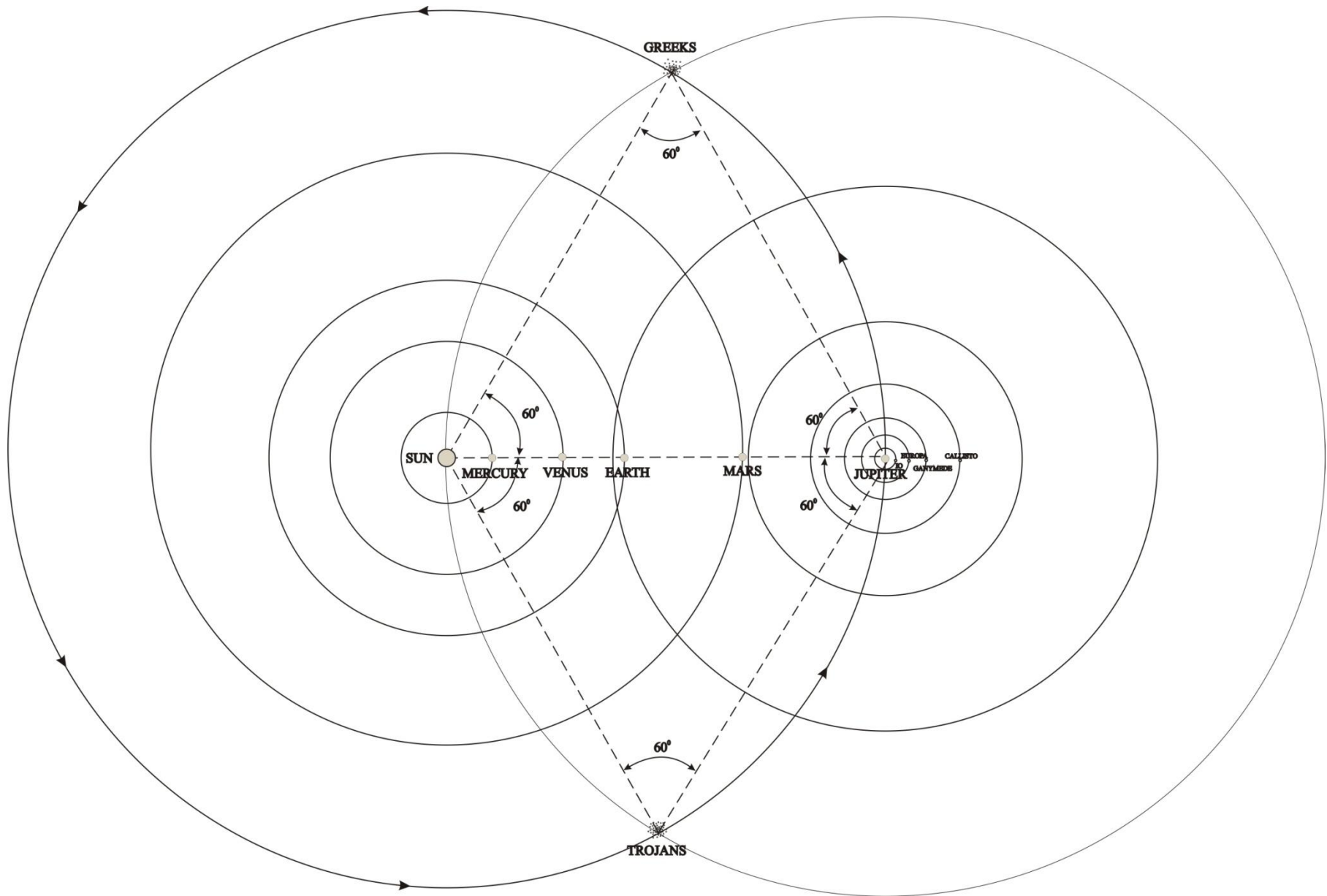


Fig. 7. Greeks and Trojans

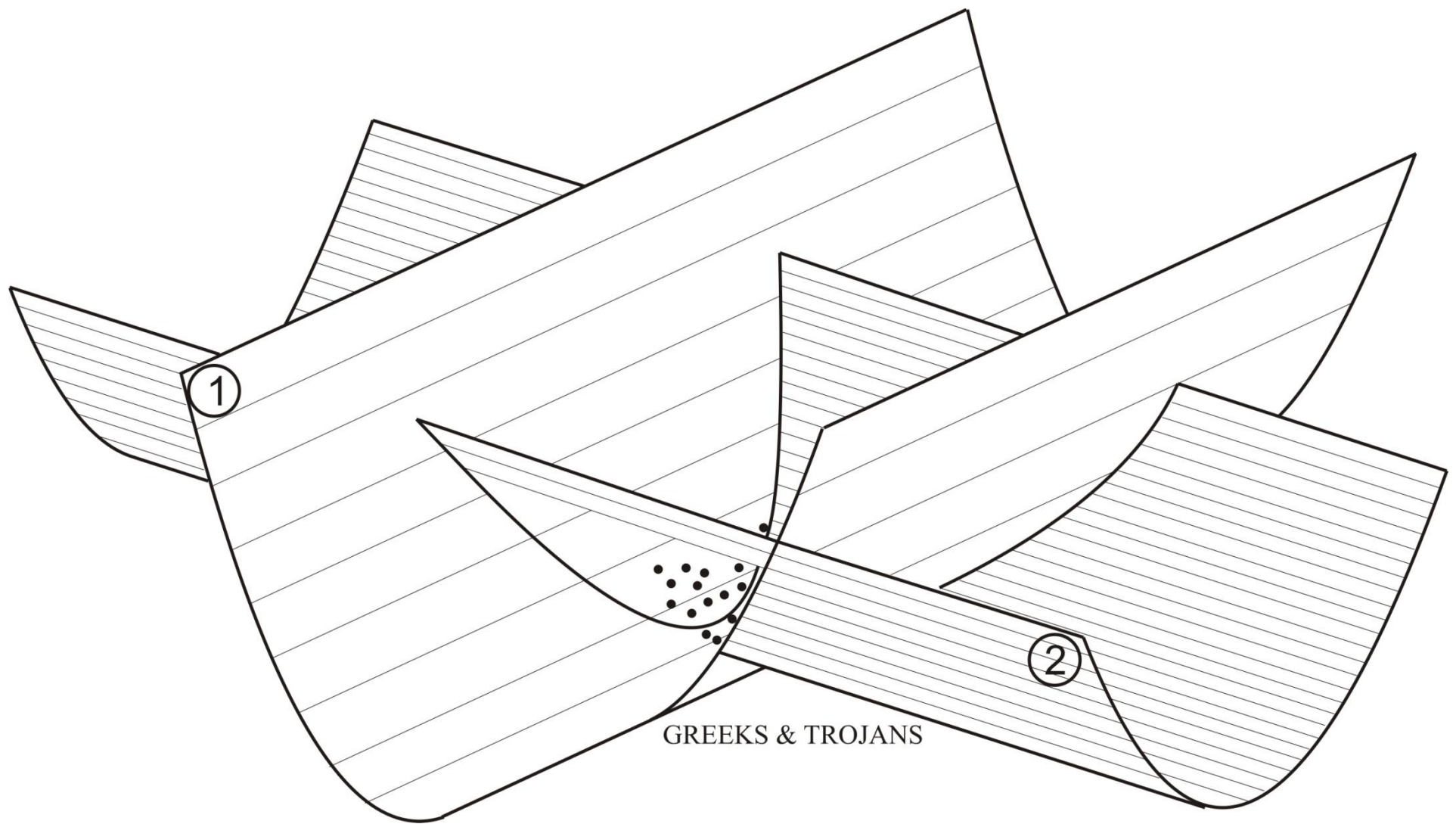


Fig. 8. Movement of Trojans on an orbit of Jupiter.
1 – the gravitational wave generated by the Sun
2 – the gravitational wave generated by Jupiter

Each body with smaller mass rotating around a body with larger mass has its own Trojans and Greeks.

Lagrange assumed that the motion of three bodies would be stable if they initially were in the vertices of an equilateral triangle (“Lagrange points”) and had relative velocities of definite values and directions.

Kirkwood holes are humps (protuberances) of the gravitational waves created in the result of the mutual superposition of the gravitational waves generated by the Sun and Jupiter.

The spiral structure of star systems is the same as the structure of spiral, elliptic and irregular galaxies.

Planets, dwarf planets and asteroids are set in rotation by the gravitational waves generated by stars.

The predominance of the stars with smaller mass, planets, dwarf planets and asteroids around the stars that rotate directly from the west to the east around its axis is explained by the fact that the crests of the gravitational waves generated by stars bend around the parts of these bodies which are located on the outer side of the orbit as compared to those that rotate in the opposite direction.

The reverse rotation of Venus, Uranus and Pluto as to the clockwise rotation if one watches it from the North Pole is explained by the fact that the crests of the gravitational waves generated by the Sun bend around the parts of these bodies located on the inner side of the orbit as compared to the planets rotating in the reverse direction (fig. 9, 10 and 11).

The parameters of the gravitational wave generated by the Sun made it possible to explain the rapid rotation of planets-giants around their axis.

The action of gravitational waves on the bodies with different surface area is the same as the action of wind on the sails of the yachts of various classes.

It is known that the more the number of sails is, the higher the yacht velocity is, under all other conditions being equal. Planets-giants rotate rapidly around their axes because they have a greater drag.

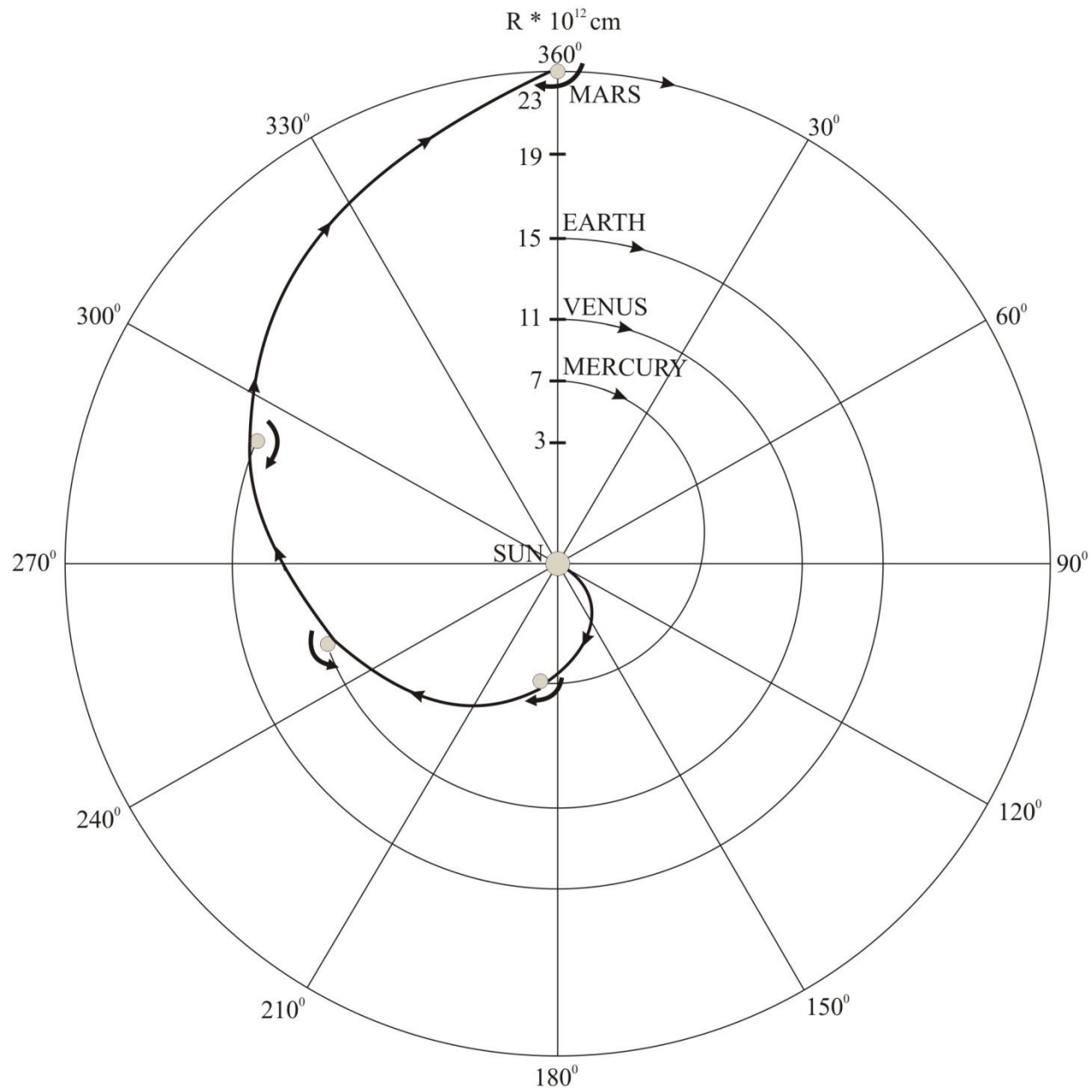


Fig. 9. Direction of distribution of a gravitational wave generated by Sun from Mercury to Mars.

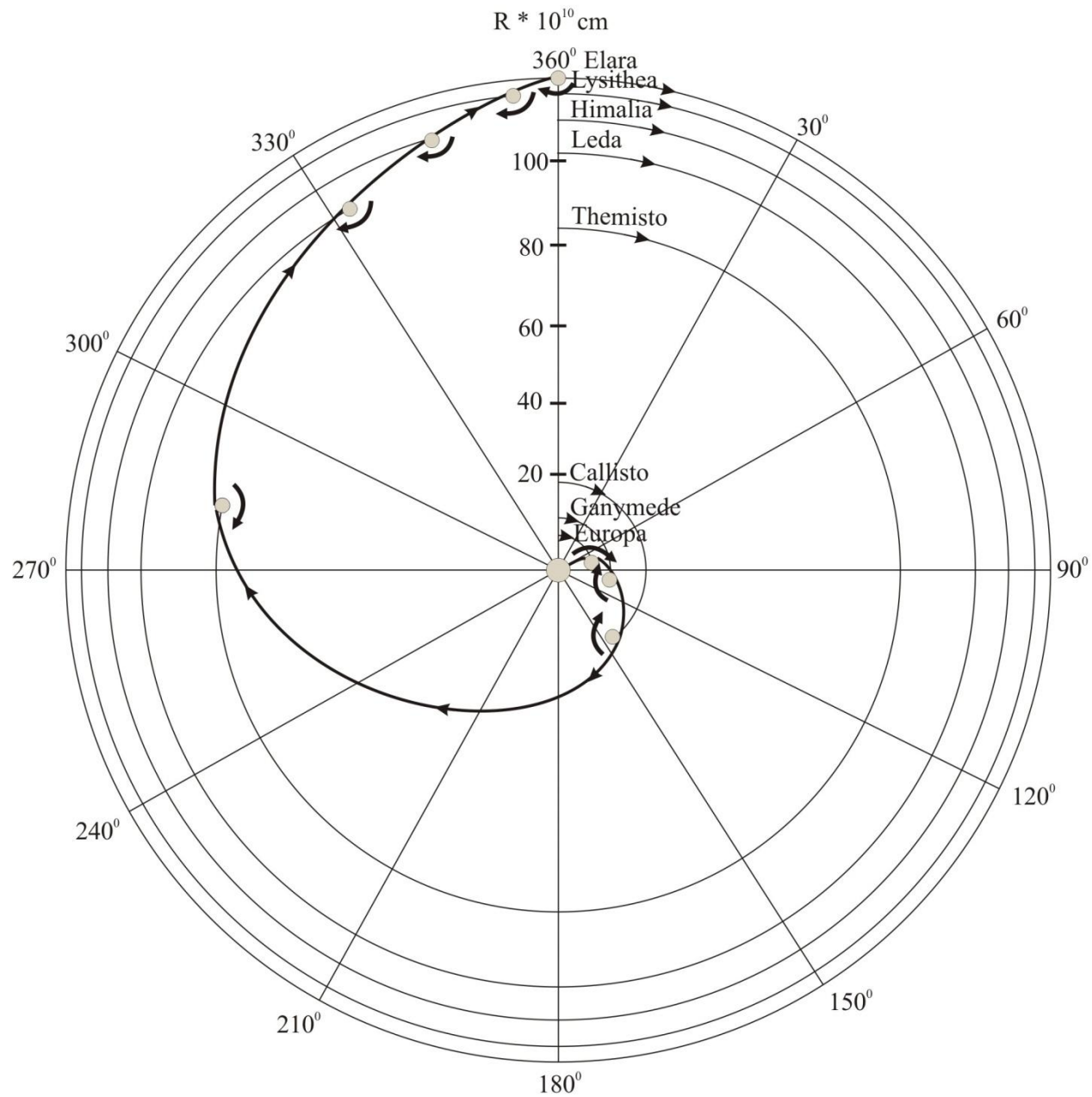


Fig. 10. Direction of distribution of a gravitational wave generated by Jupiter from Europa to Elara.

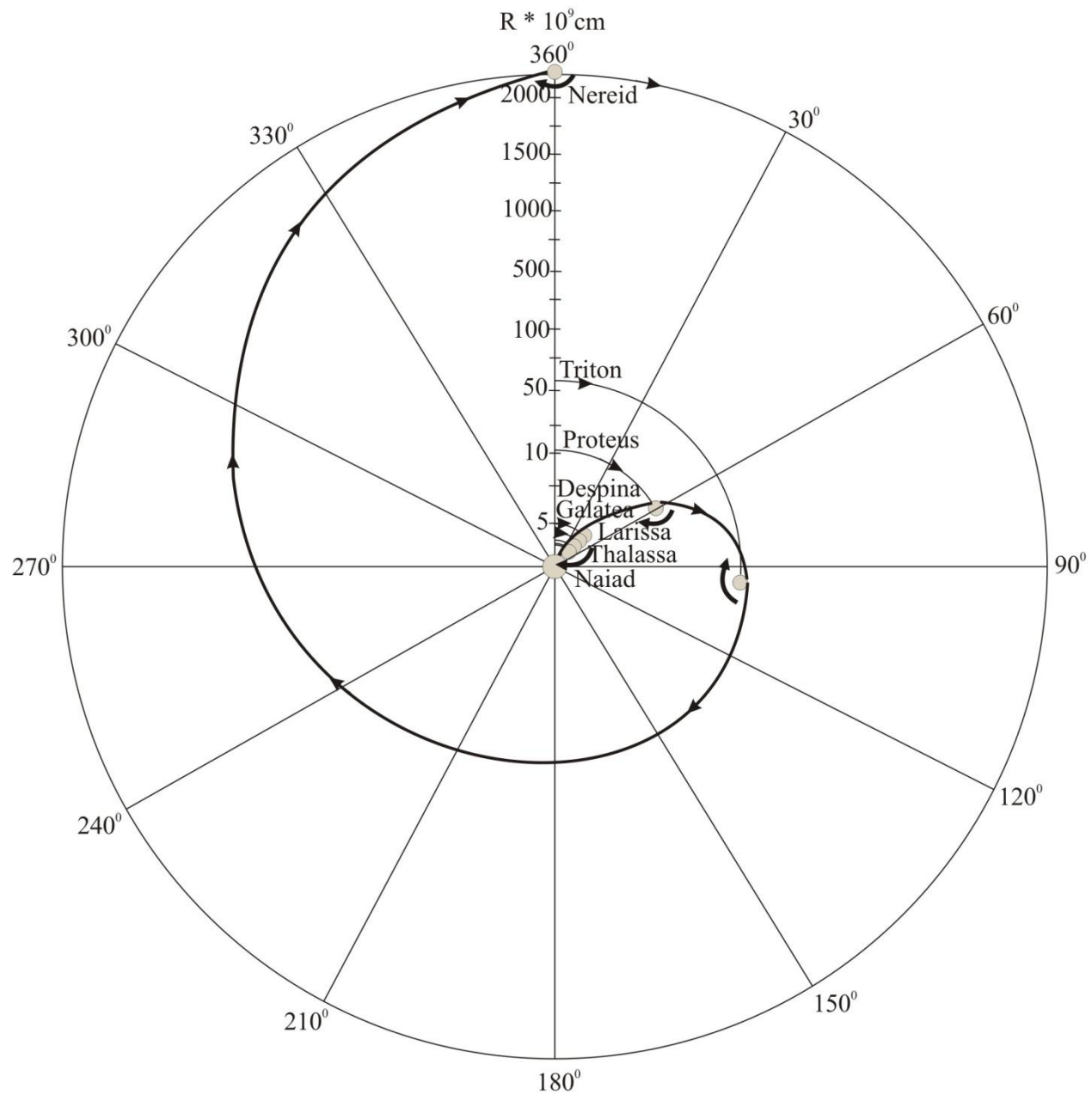


Fig. 11. Direction of distribution of a gravitational wave generated by Neptune from Naiad to Nereid.

The motion of planetary rings and planetary satellites around planets is the same as the motion of stars with smaller masses, planets, dwarf planets and asteroids around stars.

The shape, volume and density of planetary systems are determined by the parameters of the gravitational waves generated by planets.

The parameters of gravitational waves generated by planets are determined by the mass, gravitational field constant, angular velocity rotation and other planetary parameters.

Planetary rings and planetary satellites were formed in the cavities of the gravitational waves generated by planets.

The location of planetary rings and planetary satellites in the cavities of the gravitational waves make it impossible for these bodies either to reach the planets or to go away from them.

Under such conditions the distance from planets to rings and satellites doesn't depend on the mass, radius, density and other parameters of these bodies.

The spiral structure of planetary systems is the same as the spiral structure of star system.

The planetary rings and planetary satellites are set in rotation by the gravitational waves generated by planets (fig. 12).

The predominance of planetary rings and planetary satellites around the planets rotating directly around their axis is explained by the fact that the crests of the gravitational waves generated by the planets bend around the parts of these bodies located on the outer side of the orbit as compared to those rotating in the opposite direction.

The parameters of the gravitational waves generated by the Sun made it possible to explain the mechanism of the formation of the rings of Saturn.

The rings of Saturn were formed in the cavities of the gravitational waves generated by Saturn.

The intervals between the rings of Saturn are the humps (protuberances) that are the same as Kirkwood hoses.

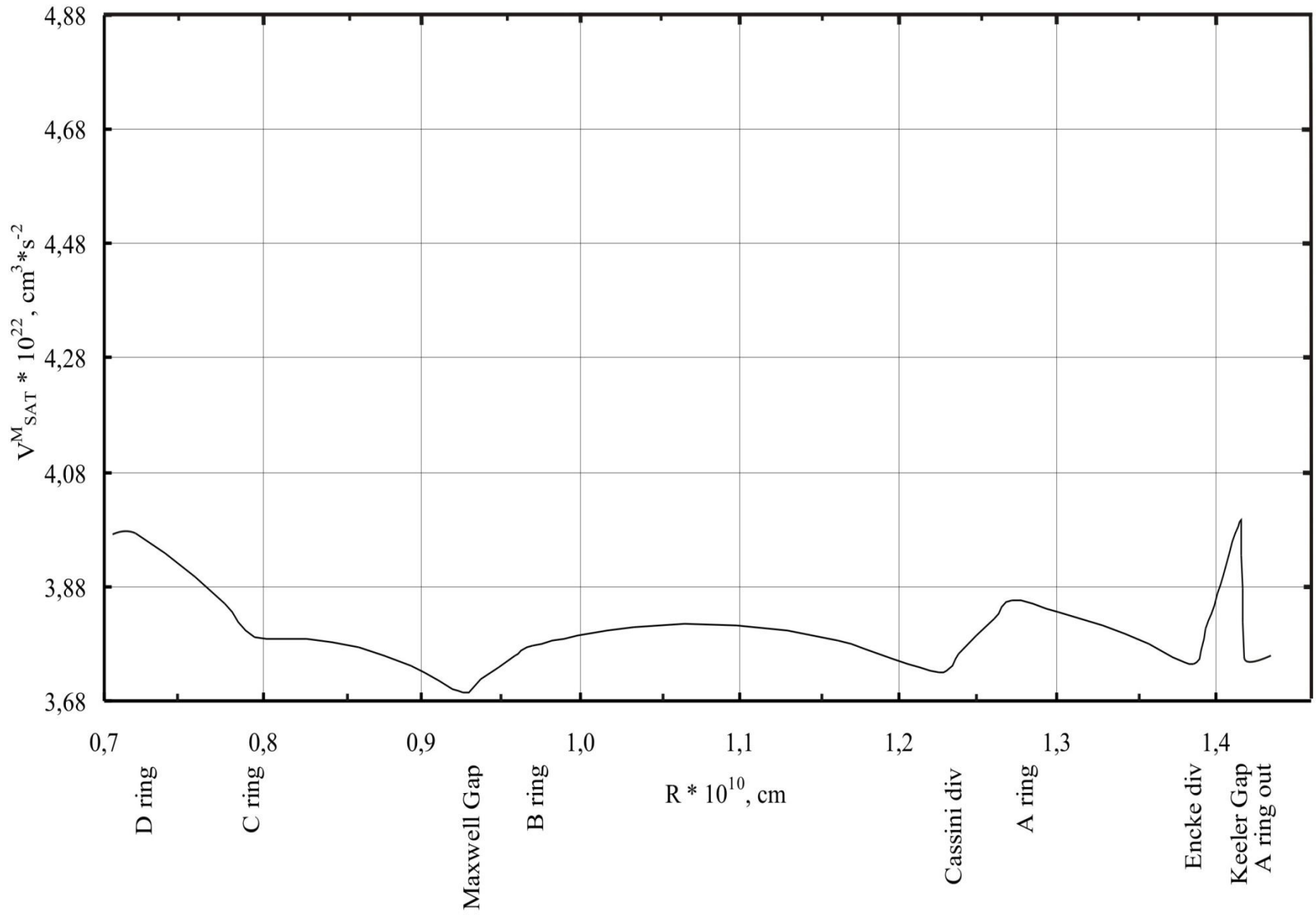


Fig. 12. The gravitational wave generated by Saturn from ring D to ring A

The motion of satellites of dwarf planets around dwarf planets is the same as the motion of planetary rings and planetary satellites around the planets.

The shape, volume and density of dwarf planets systems are determined by the parameters of the gravitational waves, generated by dwarf planets.

The parameters of gravitational waves generated by dwarf planets are determined by the mass, gravitational field constant, angular velocity of rotation and other parameters of dwarf planets.

The satellites of dwarf planets were formed in the cavities of gravitational waves generated by dwarf planets.

The location of the satellites of dwarf planets in the cavities of the gravitational waves makes it impossible for these bodies either to reach dwarf planets or to go away from them.

Under such conditions the distance from dwarf planets to the satellites of dwarf planets doesn't depend on the mass, radius, density and other parameters of these bodies.

The spiral structure of the systems of dwarf planets is the same as the spiral structure of planetary system.

The satellites of dwarf planets are set in rotation by the gravitational waves generated by dwarf planets.

The predominance of the satellites of dwarf planets around dwarf planets rotating directly around its axes is explained by the fact that the crests of the gravitational waves generated by dwarf planets bend around the parts of these bodies located on the outer side of the orbit as compared to those rotating in the opposite direction.

The motion of the satellites of asteroids around asteroids is the same as the motion of dwarf planets and the satellites of dwarf planets around dwarf planets.

The shape, volume and density of asteroid systems are determined by the parameters of the gravitational waves, generated by asteroids.

The parameters of gravitational waves generated by asteroids are determined by the mass, gravitational field constant, angular velocity of rotation and other parameters of asteroids.

The satellites of asteroids were formed in the cavities of gravitational waves generated by asteroids.

The location of asteroids satellites in the cavities of the gravitational waves doesn't make it possible for these bodies either to reach these bodies or to go away from them.

Under such conditions the distance from asteroids to the satellites of asteroids doesn't depend on the mass, radius, density and other parameters of these bodies.

The spiral structure of asteroids system is the same as the spiral structure of dwarf planets system.

The satellites of asteroids are set in rotation by the gravitational waves generated by asteroids.

The predominance of the satellites of asteroids around the asteroids rotating directly around their axes is explained by the fact that the crests of the gravitational waves generated by asteroids bend around these bodies located on the outer side of the orbit as compared to those rotating in the opposite direction.

The parameters of gravitational waves generated by asteroids made it possible to explain the mechanism of the formation of spirals in systems of asteroids.

The motion of electrons around atomic nuclei is the same as the motion of satellites of asteroids around the asteroids.

The shape, volume and density of atoms are determined by the parameters of the gravitational waves generated by the nuclei of atoms.

The parameters of gravitational waves generated by the nuclei of atoms are determined by the mass, gravitational field constant, angular velocity of rotation and other parameters of atomic nuclei.

The curve characterizing the gravitational wave generated by atomic nucleus can't be built with the help of the factual data.

All the known atomic parameters were found not experimentally but from doubtful formulas.

Electrons were formed in the cavities of the gravitational waves generated by the nuclei of atoms.

The location of electrons in the cavities of the gravitational waves doesn't make it possible for these

bodies either to reach to atomic nuclei or to go away from them.

Under such conditions the distance from atomic nuclei to electrodes doesn't depend on the mass, radius, density and other parameters of these bodies.

The electrons in atoms rotate in the cavities of the gravitational waves generated by nuclei, but not along free from radiation "quantum orbits", that correspond to definite energy levels.

The stability of atom is due to the fact that gravitational waves don't allow electrons fall down on a nucleus.

From our point of view all the atomic parameters might be made more precise with the help of the formulas (25-56) from the work [1] after the completion of the International Avogadro Coordination experiment on defining the number of atoms in one-kilogram crystal of silicon - 28

The spiral structure of atom is the same as the spiral structure of asteroids system.

Electrons are set in rotation by the gravitational waves generated by atomic nuclei.

The predominance of electrons around the nuclei of atoms rotating directly around their axes is due to the fact that the crests of the gravitational waves generated by nuclei bend around the parts of these bodies located on the outer side of the orbit as compared to those rotating in the opposite direction.

IV. CONCLUSIONS.

The obtained results showed that:

- the mechanism of the formation of "axis of evil", nebulas, galaxies accumulations, galaxies, stars, planets, planetary rings, planetary satellites, planetary satellites rings, dwarf planets, dwarf planets satellites, asteroids, satellites of asteroids, comets, atomic nuclei and other bodies have been explained;
- the mechanism of winding round of the majority of spiral galaxies clockwise and in the opposite direction has been explained;

- gravitational waves have been discovered and their parameters have been found;

- the reason for planets being located at definite distances from the Sun in accordance with Titius Bode law has been explained;

- the mechanism of the motion of the Greeks and the Trojans along the orbits of Jupiter, Neptune, the Earth and other bodies has been explained;

- the mechanism of the formation of asteroid belts has been explained;

- the mechanism of the formation of Kirkwood astrohatches has been explained;

- the mechanism of reverse rotation of Venus, Uranus, Pluto and other bodies has been explained;

- the mechanism of rapid rotations of planets-giants has been explained.

- the mechanism of the formation.

LITERATURE

1. Tsiganok E.P., Tsiganok O.E. Measuring the physical and astrophysical constants and other bodies parameters. // Nauka i Studia, №5, 2008.

2. Tsiganok E.P., Tsiganok O.E. Measuring gravitational constant and the main the Earth, the Sun and the Moon parameters. //Nauka I Studia, №2, 2009.

3. Examination of Evidence for a Preferred Axis in the Cosmic Radiation Anisotropy Phys. Rev. Lett. 95, 071301 (2005).

4. Kate Land and Joao Magueijo. Phys. Rev. Lett. 95, 071301 (2005).