SHORT DERIVATION OF THE THEORY AND ITS SOLUTION

The momentum operator equation

Planetary orbits are considered as ellipses (1. Kepler's law) and are described here in polar coordinates. The ellipses form a scalar field (eccentricity constant and shortest distance from the center (r0) variable or vice versa).
The trajectory pulse is described as a vector with a length factor "L/r" and an angle-dependent vector component. "L" is the amount of orbital angular momentum, "r" the distance from the center.
The gradient of the scalar family of trajectories is formed in cylinder coordinates (Z component = 0) and both relationships squared result in:

$$\mathbf{p}^2 = \frac{\mathbf{L}^2}{\mathbf{r}^2}\left(\frac{\mathbf{d}}{\mathbf{d}\mathbf{r}}\,\mathbf{r}\right)^2$$

Now the lines of the gradient field are considered as a scalar function field and the functions are designated as Ψ instead of "r" and the gradient formed on them should have the direction and magnitude of the orbital impulse.
P^2 is identical to the product of a momentum considered as complex with its conjugate complex and this gives rise to the relationships:

$$\vec{\mathbf{p}}\,\Psi = \frac{L}{i}\nabla\Psi \quad \text{bzw.} \quad \vec{\mathbf{p}}\,\Psi^* = -\frac{L}{i}\nabla\Psi^*$$

„i" is the imaginary unit

Wave equation

The momentum operator equations are derived according to time (Ψ and momentum are viewed as time-dependent) and at the same time the time derivative of the momentum is viewed as a negative gradient of the Hamilton function (H) (2nd Hamilton equation). If one multiplies the "Hamilton gradient" from the left by Ψ (analogous to Ψ *), uses the product rule in reverse, sets the resulting term sum equal to the time derivative of the momentum operator equation and summarizes the

2nd and 3rd as well as the 1st and 4th terms, so can we apply the product rule again and we get a gradient term which can only become "zero" if the gradient is applied to a constant or an extreme value. If you set this constant to "0", you get equations that correspond to the Schrödinger equation, the only difference being that instead of the reduced Planck quantum of action, the value of the classical orbital angular momentum (L) is used.

$$\frac{L}{i}\dot{\Psi} = H\Psi \quad \text{bzw.} \quad -\frac{L}{i}\dot{\Psi}^* = H\Psi^*$$

interpretation

Because of the equivalence of the systems of equations, all interpretations of quantum theory are now adopted. This means, among other things, that the solution functions Ψ and Ψ * represent probability amplitudes and their complex product probability densities.
In the following only Ψ is used.

Solution approach

The approaches of the quantum theory do not lead to the goal, since the orbital angular momentum is not a natural constant.
As a solution for the gravitational field, a plane wave is used for Ψ with the product of the canonical variables p and q (independent of time) and the product of the Hamilton operator H, which is identical to the energy when independent of time, and the time itself.

$$\frac{L}{i}\dot{\Psi} = H\Psi \quad \text{bzw.} \quad -\frac{L}{i}\dot{\Psi}^* = H\Psi^*$$

$$\boldsymbol{\Psi = \Psi_0 e}^{(i(pq+Ht)/L)}$$

The time derivative of such a wave approach directly provides the wave equation for cases in which the orbital angular momentum is not time-dependent.
Physically, such a wave approach is questionable in classical mechanics if it is to be used to describe e.g. planetary orbits, since plane waves only exist without a force center, i.e. no potential may occur in the Hamilton operator. The momentum operator equation can only be satisfied for such an approach at

locations where extreme values occur for all variables and thus the solution is always only valid for locations that correspond to them. Fortunately, this is sufficient to describe conic sections if those locations coincide with the vertices along the major axis. That the plane wave approach in the gravitational field is physically generally correct can only be understood under the conditions of the general relativity theory (gravitation theory, GTR), because there the potential of the center of force is understood as a space and time curvature and the Newtonian gravitational potential occurs in the hamilton operator itself not on.

Because the approach is intended to try to obtain information about the apses (near and far point) of the planetary orbits, only the radial solution is sought in the plane case. The approach itself provides COSINE and SINE functions (probability amplitudes), the squares of which result in a probability density which together have the value "one" everywhere, which means that an absolute specification of a radius is not to be expected, only the periods of the two trigonometric functions say something about an arbitrary wavelength r (radial distance, for example, two maxima). With the relation

$$\mathbf{P = L * k}$$

(k is the wave number, reciprocal to a wavelength) then reads a general representation of the solutions

$$r_{\cos} = r_0 \bullet \frac{n}{m} \bullet \pi^{l} \quad \text{bzw.} \quad r_{\sin} = r_0 \bullet \frac{\left(n + \frac{1}{2}\right)}{m} \bullet \pi^{l}$$

Here “r” is the distance from the center of rotation, “r0” is any radius (e.g. the distance where the first planet happens to be formed), n, m are positive integers and applies to *l*

$$-\infty \leq l \leq \infty$$

A meaningful value r0 must be sought, but the wavelengths “W*l*” are related to each other in the ratio of rational numbers and integer exponential values of the irrational circle number **π**.

Meaningful results can only be expected if the numerical values remain small, because then one can assume systematic relationships.

A comprehensive, mathematically justified presentation of what has been set out in the previous sections is given in the complete theory itself (the English translation is in progress).

Application of the theory to the planets of the solar system

(in the full theory the approach is also applied to the moons of the planets)

1. STEP

A reasonable value is sought for r0. The astronomical unit can be used here (AU, corresponds to the mean distance between the earth and the sun), as on the one hand all planet values can be given in simple numbers and on the other hand the relationship between different waves is striking because Saturn is on top a COSINUS² wave with the wavelength (W*l*) π^2AE in a very good approximation on the first maximum and Jupiter on the first maximum of the SINUS² sister wave (same W*l*) and one can assume that the largest planets have shaped the value r0.

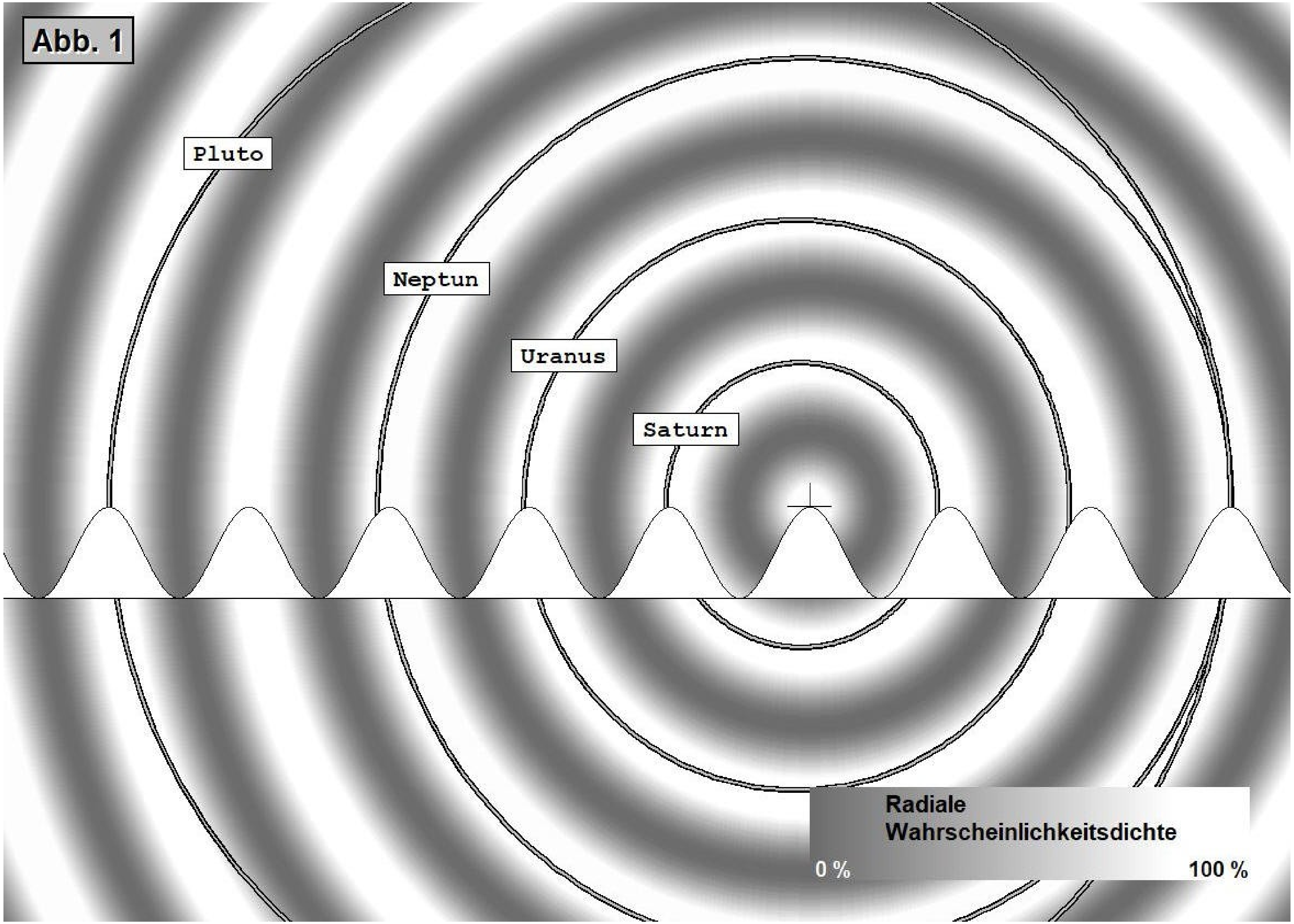
2. STEP

The COS² wave (Saturn series) of wavelength π^2 AE is examined to see whether planets or their apses are on the other maxima. The following table shows the theoretical values in comparison to the astronomical data and the relationship bitween wave and path is shown in Fig. 1

Table 1 of the apses (p, a) and mean (m) values of the COS² wave with a wavelength of π^2 AU (for m = 1, *l* = 2 and **n** = 1 - 5)

Planet		n	astronom. value (AU)	value (AU) theor.	deviation	%	Ψ^2 %
SATURN	_p	1	09.0413	09.8696	0.83	8.39	93.21
	_m	1	09.5826	09.8696	0.29	8.92	99.17

	_a	1	10.1238	09.8696	0.25	2.58	99.35
URANUS	_p	2	18.2947	19.7392	1.45	7.32	80.30
	_m	2	19.2010	19.7392	0.54	2.73	97.09
	_a	2	20.1072	19.7392	0.37	1.86	98.63
NEPTUN	_p	3	29.7074	29.6088	0.10	0.33	99.90
	_m	3	30.0470	29.6088	0.44	1.50	98.06
	_a	3	30.3865	29.6088	0.78	2.63	93.97
PLUTO	_p	3	29.6588	29.6088	0.05	0.17	99.97
	_m	4	39.4820	39.4784	0.01	~ 0	99.99
	_a	5	49.3052	49.3480	0.04	~ 0	99.98



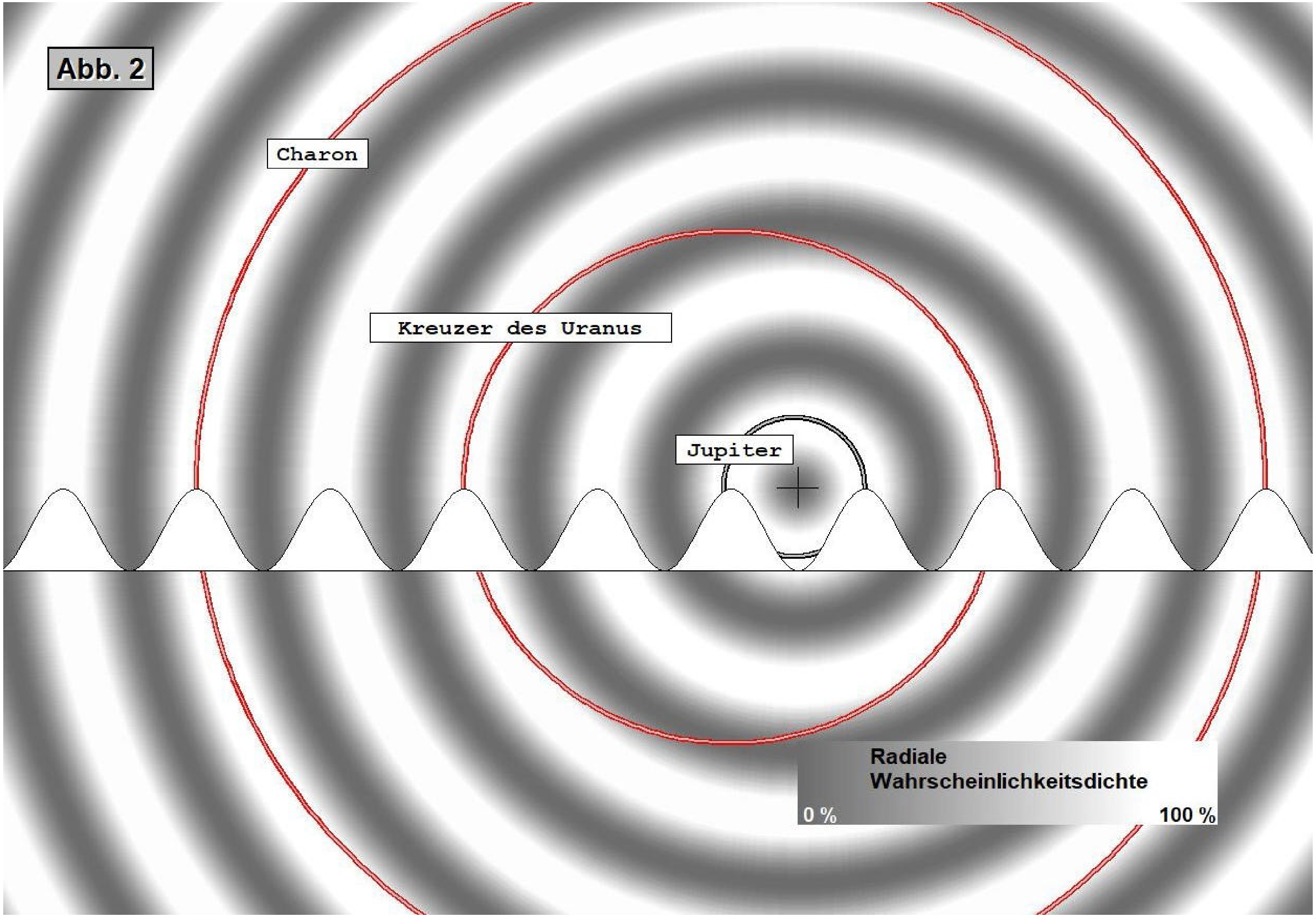
Similarly, it is checked whether and how well Jupiter is on the first maximum of the SINUS²_Welle. It is surprising that only the orbit of a planet runs one maxima of the SIN²_wave, because the COS²- and SIN²_wave should be equivalent, especially since Jupiter is the most massive planet. Hypothetical trajectories that also occupy at least the 2nd to 5th maximum are therefore also taken into account. It is noticeable that they cross the orbits of Uranus and Pluto. Moreover, they have the same mean distance and would be suitable for collision or capture. Captures are possible if the speed difference is smaller than the escape speed of the larger celestial body when approaching. Accordingly, traces of such events should be found.

Table 1 of the apses (p, a) and mean (m) values of the SIN^2 wave with a wavelength of π^2 AU (for m = 1, *l* = 2 and **n** = 0 – 4)

Planet		n	astronom. value (AU)	value (AU) theor.	deviation	%	Ψ² %
JUPITER	_p	0	04.9511	04.9348	0.016	0.33	99.99
	_m	0	05.2030	04.9348	0.268	5.43	99.27
	_a	**0**	**05.4548**	**04.9348**	**0.520**	**10.5**	**97.29**
Cruiser of URANUS	_p	1		14.8044			
	_m	1.5		19.7392			
	_a	2		24.6740			
CHARON	_p	3		34.5436			
	_m	3.5		39.4784			
	_a	4		44.4132			

Intermediate step (apsid differences in AU)

Planet	Periapside	Apoapside	difference	wavelength W/ = 1/6 AU	rel. deviation „n“ or „n+1/2“	Difference	diff. to W/ = 1/6 AU Ψ² % (without shift)
JUPITER	4.9511	5.4548	0.5037	3.0222	3	0.0222	99.50
SATURN	9.0413	10.1238	1.0825	6.4950	6.5	0.0050	99.98
URANUS	18.2947	20.1072	1.8125	10.875	11	0.1250	85.36
NEPTUN	29.7074	30.3865	0.6791	4.0746	4	0.0746	94.61



The red paths are assumptions of possible crossing paths to the COS^2 wave if the Jupiter wave (SIN^2) would have occupied the first 5 maxima!

Traces of the assumed (original) tracks?

- Pluto has an extremely large moon in relation to it, Charon (approx. 11.5% of Pluto's mass), which is more
  than 4 powers of ten more massive than four other moons combined.
  While the orbits of these 4 moons can be well described with maxima of a wave, Charon deviates from them.
  Assumption: Charon was captured by Pluto.
- Uranus has a special feature, its axis of rotation is tilted by approx. 90 degrees.
  For Jupiter, Saturn, and Neptune, the 1/6 AU wave has been preserved in the apsidal differences, but their mean distances are obviously shifted due to a disturbance. Uranus shows no relation to wave 1/6 AU with over 90% probability.
  Assumption: Uranus has collided with a larger object (cruiser of the Uranus orbit).

3. STEP

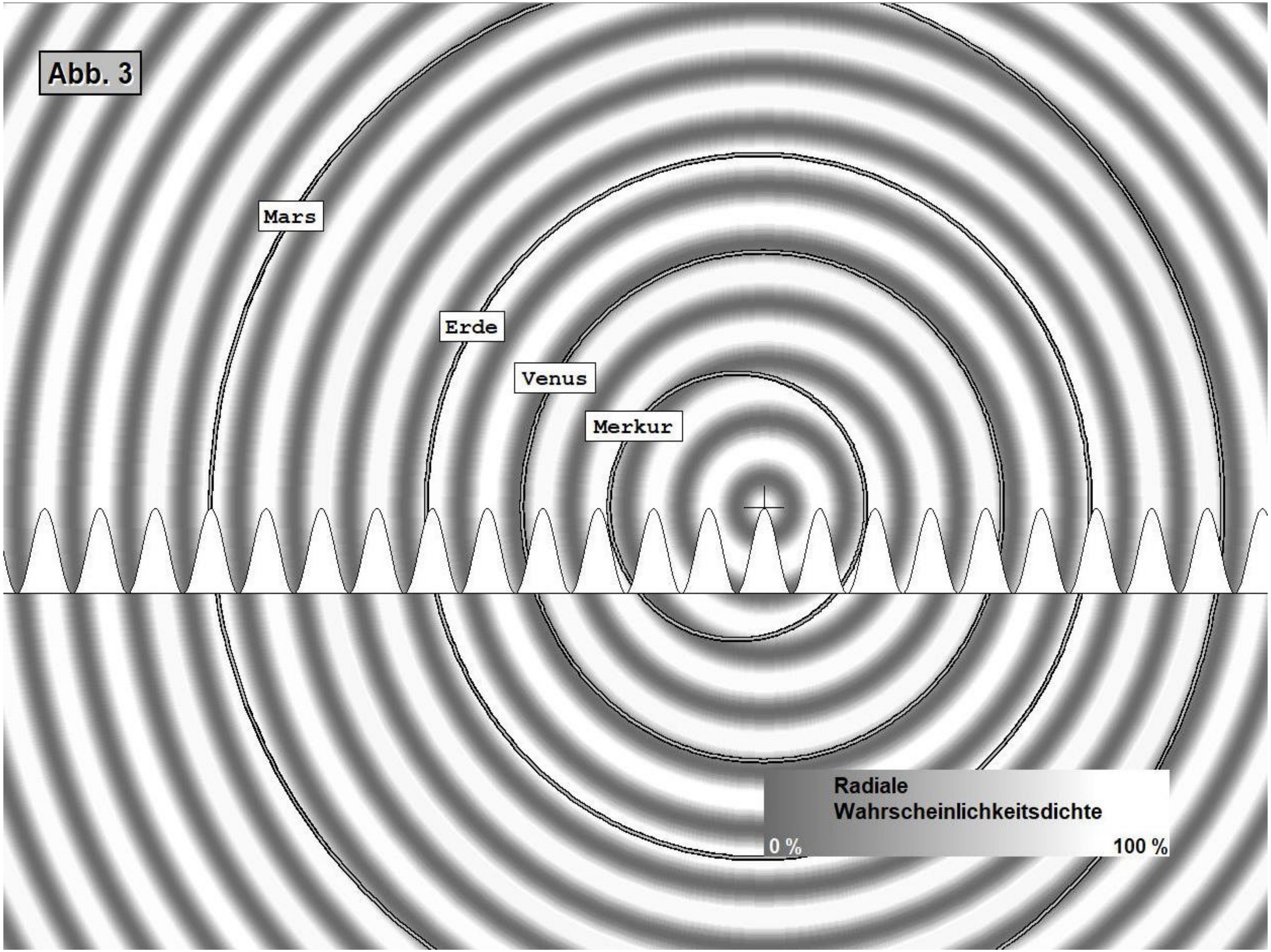
The results of the outer planets can be used to study the inner planets. The wavelength π^2 AU provides probabilities for the inner planets between 77% and 99%, but is unsuitable for description. Pluto showed that the values of apses play a role. The astronomical unit itself as a wavelength is also unsuitable because it does not describe Mercury and Venus. But harmonics from it could bring the solution. The apoapsid value (far point of the orbit) of Mars provides an indication. It is 1.6663 AU, which corresponds to the value 5/3 up to 0.02%. However, the Mars apsid cannot be on the 5th maximum, since Mercury also has clear apsidal differences and therefore at least 6 maxima must exist. The obvious assumption is that the Mars apoapside lies on the 10th maximum of a wave of wavelength 1/6 AU.
This wave relationship and everything that can be assumed from it is dealt with and shown in Tables 3 and 4.

Table 3 of the apses (p, a) and mean (m) values of the COS² wave with a wavelength of 1/6 AU (for m = 1, *l* = 0 and **n** = 1 - 10)

Planet		n	astronom. value (AU)	value (AU) theor.	deviation %	Ψ^2 %
empty	_m	1		0.1667		

MERKUR	_p	2	0.3074	0.3333	0.026	8.78	77.95
	_m	2.5	0.3870	0.4167	0.030	8.90	84.77
	_a	3	0.4666	0.5000	0.033	6.60	65.33
VENUS	_p	4	0.7184	0.6667	0.052	7.76	31.48
	_m	4	0.7233	0.6667	0.057	8.51	23.26
	_a	4	0.7281	0.6667	0.061	9.20	16,09
primeval MOON	_p	5		0.8333			
	_m	6		1.0000			
	_a	7		1.1667			
ERDE	_p	6	0.9833	1.0000	0.016	1.67	90.41
	_m	6	1.0000	1.0000	0.000	0.00	99.99
	_a	6	1.0167	1.0000	0.016	1.67	90.41
MARS	_p	8	1.3815	1.3333	0.482	3.61	37.87
	_m	9	1.5240	1.5000	0.024	1.60	80.89
	_a	10	1.6665	1.6667	0.000	0.0	99.99

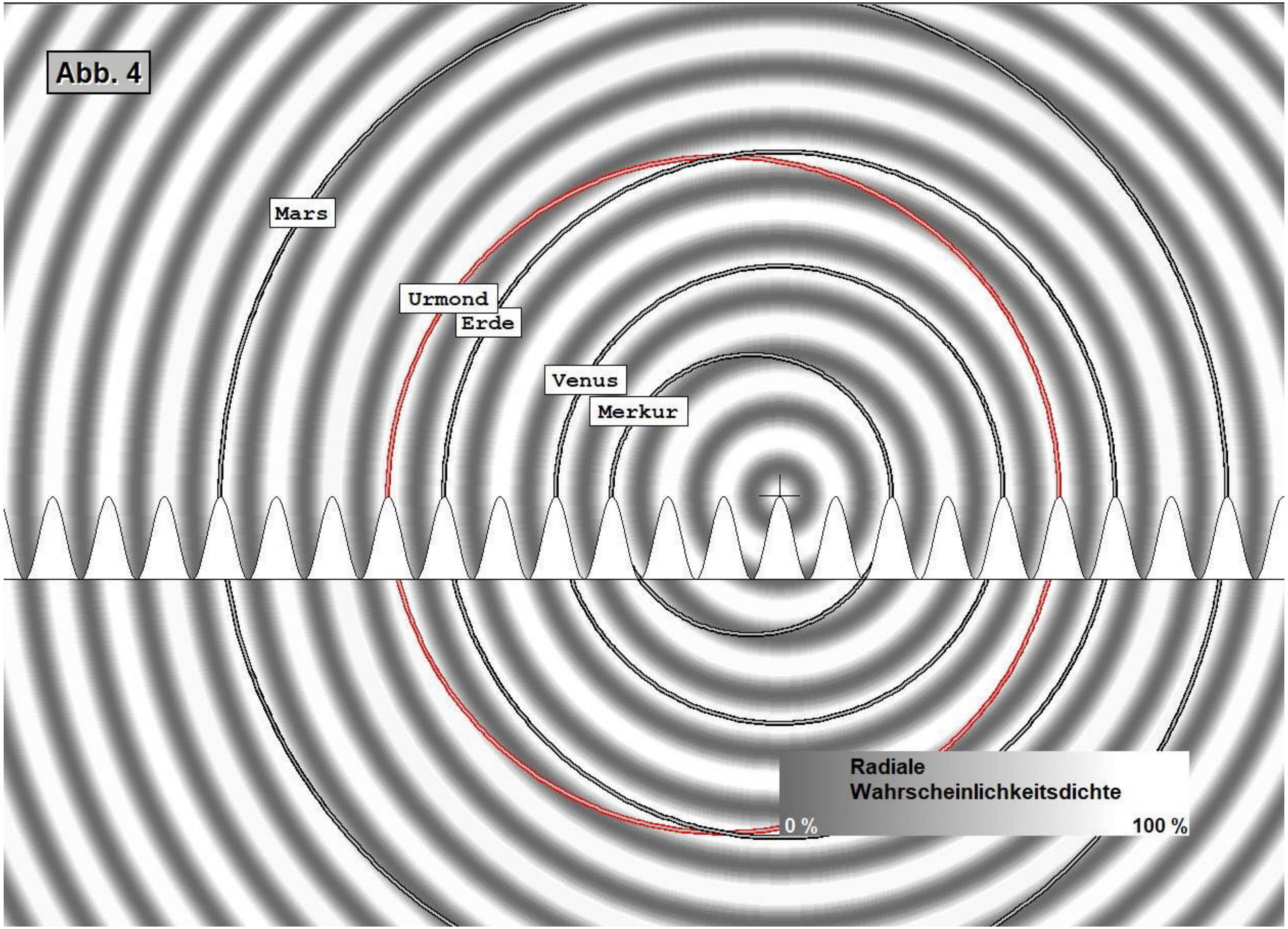
The spaces 5 and 7 lead to the assumption that there was originally a planet that was captured by the sun at the same mean distance from the sun as the earth was captured by it. Hence the name "primeval moon". It can be clearly seen that the COS²_wave (1/6 AU) delivers significantly poorer probability values than the comparative observations on the outer planets. If the assumption of moon capture (or crash?) is correct, then disturbances should be noticed in the apsidal values of the inner planets. Amazingly, the difference in the apses of the earth's orbit provides an indication. It is 0.0334 AU (which corresponds very precisely to the value 1/30 AU, 0.2% deviation). And actually deliver whole- or half-integer corrections to the astr. Apsidata with the value 0.0334 AU much better agreement and high values of the probability density (Ψ^2).
The orbit of Mercury in both apses seems to be shifted inwards by about 1/30 AU, the orbit of Venus outwards by 1.5/30 AU, the periapside of Mars by 1.5/30 AU outwards, the apoabside not and the earth apsids by ± 0.5/30 AU.
The graphical representation of the uncorrected vestibule data (astronomical values), the corrected value table and graphical representation follow:



If one corrects the astronomical vestibules by the given factors in the assumption in order to simulate the assumed original vestibule positions and evaluates the situation, the result is convincing in terms of both the values and the probability information. Since this is related in all cases to the earth apsid difference, it speaks for the earth-moon event.

Table 4 with half-integer correction values with a wavelength of 1/30 AU of the apses (p, a) and mean (m) values of the COS^2 wave with a wavelength of 1/6 AU (for m = 1, *l* = 0 and **n** = 1 - 10)

Planet		n	astronom. value (AU)	value (AU) theor.	deviation	%	Ψ² %
MERKUR	_p	2	0.3074 + 1/30	0.3333	0.007	2.23	98.07
	_m	2.5	0.3870 + 1/30	0.4167	0.004	0.86	99.52
	_a	3	0.4666 + 1/30	0.5000	~ 0	~0	99.99
VENUS	_p	4	0.7184 - 1.5/30	0.6667	0.002	0.26	99.89
	_m	4	0.7233 - 1.5/30	0.6667	0.007	1.00	98.44
	_a	4	0.7281 - 1.5/30	0.6667	0.011	1.69	95.43
ERDE	_p	6	0.9833 + 0.5/30	1.0000	~ 0	~ 0	99.99
	_m	6	1.0000	1.0000	0	0	100.00
	_a	6	1.0167 - 0.5/30	1.0000	~ 0	~ 0	99.99
MARS	_p	8	1.3815 - 1.5/30	1.3333	0.002	0.14	99.88
	_m	9	1.5240 - 0.75/30	1.5000	0.001	~ 0	99.96
	_a	10	1.6665	1.6667	~ 0	~ 0	99.99



Summary
With the known theories of physics, no approach can be found that almost realistically describes the situation of the planetary orbit distances and their apsidal values. Since Johannes Kepler was demonstrably looking for an explanation to supplement his three rules, there have been many attempts. The sequence of numbers established by Titius, Bode and Wurm is relatively well known, but has so far eluded a physical explanation.

The macro-quantum theory offers, as was briefly shown above, an approach to the solution of the problem.
Much more evidence is presented in their detailed description (analyzes of the lunar orbit data of planetary moons, for example)
With its results in the analysis of the structure of the solar system, macro-quantum theory has gained its justification to be incorporated as a supplementary theory within the framework of the existing theories of theoretical physics and it is to be expected that the knowledge horizon of all theories can be expanded as a result.
It is therefore necessary to examine their relationship to the established theories of physics, which is done in the following chapter (in brief).

RELATIONSHIPS OF MACROQUANTUM THEORY TO OTHER AREAS OF THEORETICAL PHYSICS

Classic mechanics

Since macro-quantum theory was derived from parts of mechanics, the relationship is immediate.

Quantum theory

Due to the striking similarity of the equations and the complete adoption of the interpretations and considerations, the correspondence principle of physics can only be understood in such a way that the Schrödinger-equation, which represents an absolute, is the smallest possible form of the corresponding equation present in macroquantum theory. As a result, there must be a direct mathematical relationship between the classic orbital angular momentum and the reduced Planck quantum, i.e. the orbital angular momentum itself is a quantized physical quantity.
The relationship is in the form

$$L = (n+1/2)h/\pi$$

guarantees and plays an extraordinary role if one wants to make the transition to quantum physics in other theories.

Special theory of relativity

The previous derivation of the basic equations of macroquantum theory leads to results that are asymmetrical in time and space, as is also the case with the

Schrödinger equation. For the sake of complete analogy between the two theories, however, this deficiency can be remedied at high speeds in the same way as Dirac, Gordon, Klein and others took with quantum theory.
However, this means that negative values are also allowed for the energy. While in quantum theory this "deficiency" can be remedied by means of antimatter, this does not work in macro-quantum theory. The only way out is to see "negative energy" as something independent outside of baryonic matter (matter that belongs to the standard model of particle physics). Mathematically it turns out that it is repelled by the baryonic matter. Therefore it cannot be a question of the mysterious "dark matter" and all that remains is to identify it with the "dark energy".
Since mathematically only 2 forms of energy exist, baryonic and dark matter belong in one class, dark energy in the other. Because of the mathematical formal equality of both energy classes, if there are equal amounts of them in the same place, they should compensate each other and completely withdraw them from the access of each of the individual classes and from such a place (path unclear) both classes could arise in the same amount , so to speak from "nowhere".

General theory of relativity, gravitation
The wave equation of macroquantum physics can only be solved by "plane" waves when applied to processes caused by gravity, as studies in the solar system and on the planets' moons have shown. This is surprising at first, since the gravity of the central body seems to be there.
However, the general theory of relativity (GTR) transforms the Newtonian gravitational potential from the energy term (Hamilton operator) into the metric (mass tensor that describes the curvatures of space in differential geometry).
This means that no more force occurs and plane waves are spherical waves of constant wavelength in central bodies (apart from relativistic effects).
The mathematical relationship between the orbital angular momentum value and the reduced Planckian quantum of action (see above) shows that the angular momentum can only change by even-numbered values, its smallest value corresponds to a reduced quantum, but that it itself only has odd-numbered values.
Interestingly, a spin value of 2 occurs in the ART.
These references show that macroquantum theory can be used via this relationship with known solutions of GTR and the relationship known from mechanics

$$L^2 = m^2 \; G \; M \; k$$

to gain access to the behavior of gravitation in the quantum domain.
"m" is the mass of the rotating object, "G" the gravitational constant, "M" the central body mass and "k" the half-parameter (distance of the ellipse from the center perpendicular to the main axis).
Planck units play an important role and a "force" that is described in a different context (fine structure constant).

(Atoms and spectral lines) - fine structure constant
The fine structure constant discovered by A. Sommerfeld is called the coupling constant of the electromagnetic interaction.
In macroquantum physics it is treated (not part of it, but helpful for understanding the relationships in the quantification of gravity The limit force is identical to the gravitational force between two Planck masses and also the Coulomb force between two Planck charges. As a number, it defines the ratio of the Coulomb force between two elementary charges to a fictitious elementary limit force, so it is exactly something like π, which defines the ratio between the circumference and the diameter.
The limit force is identical to the gravitational force between two Planck masses and also the Coulomb force between two Planck charges.

The considerations on the fine structure constants are made separately.
There are consequences for the periodic table of the chemical elements and also for gravitational singularities in the GTR.

CONCLUSIONS

To the wave solution of the theory

* The macroquantum theory (MQT) allows physically based statements about the orbit structures in the gravitational field.
* MQT solutions are plane waves that represent probability densities and, with their maxima, determine the apsidal positions of objects in the gravitational field.

*   In the solar system, two wavelengths (W*l*) determine the essentials, outer planets (Wl = π^2 AU) and inner planets (W*l* = 1/6 AU).
*   Charon is a neighboring planet captured by Pluto
*   The Uranus axis has tilted due to a collision with the neighboring planet of Uranus
*   The earth's moon is a neighboring planet captured by the earth
*   The effect of the 1/6 AU wave also seems to play a role in the asteroids and is detectable in the apsid differences in Jupiter, Saturn and Neptune, but not good in Uranus.

From the correspondence on the special theory of relativity

*   Independent of the energy known to us, there is an independent form of energy that is negative.
*   Negative energy corresponds, since Einstein's energy-mass relationship still applies, to a "negative" mass and, according to Newton's law of gravitation, repels the mass of the standard model known to us and also the dark matter, thus acting like antigravity
*   The same types of energy attract each other.
*   The negative energy is identical to the dark energy.
*   If both types of energy are present in the same amount in the same place, then they can no longer be perceived individually by any type of energy.
*   The law of energy (1st law of physics) applies universally, regardless of whether we perceive something or not.
*   If there are unequal amounts of both types of energy in the universe, the difference in amount must have been there before the Big Bang and increased by the same amount during the Big Bang as the amount of the other type created by the Big Bang.
*   The contraction of this difference set before the Big Bang was the trigger for the Big Bang.
*   The Big Bang that we assumed cannot have been the first.

From the investigation of the fine structure constants

* It is an elementary force limit and an elementary limit force that is experience with the Newtonian gravitational force between two Planck masses and also with the Coulomb force between 2 Planck charges.
* The fine structure constant distinguishes the ratio of the Coulomb force to this limit force and, as a natural constant, is a rule number just like π.
* The fine structure constant is through its value control that the periodic table of the chemical elements is theoretical upwards at the 136th element.

From the principle of correspondence between mechanics and quantum theory

* The amount of the classical orbital angular momentum is not an analog physical quantity, but quantized.
* The amount is always not equal to zero.
* The smallest possible absolute value corresponds to a reduced Planck quantum.
* The amount of the orbital angular momentum can only change by 2 reduced Planck quanta.
* From the connection between the reduced quantum and the orbital angular momentum, it follows that due to the finite smallest value, similar to the uncertainty relation in quantum physics, no singularities can exist for masses (energies).
* Elementary particles with spin and rest masses are not singularities, neither are black holes.

From the application in the general theory of relativity (theory of gravity)

* In the *Schwarzschild metrics*, the quantum of action finds its way into the GTR via Theses 4 ... and provides information on quantum gravity
* Analogous to the Schwarzschild radius, there is a mass-dependent radius that cannot be fallen below, is not equal to zero and becomes smaller with increasing mass.
* The mass (energy) of the black hole must be between the minimum radius and the event horizon (Schwarzschild radius).
* The smallest mass in the Schwarzschild metric that can form a Schwarzschild event horizon (r_S) corresponds to ~ 85% of a Planck mass ($1.026735\ 10^{19}$ GeV/c^2). It probably consists of two quanta with equal proportions each

(0.51336 10^{19} GeV/c²). The event horizon is then at a Scharzschild radius of 2 Planck lengths (Planck length = 1.616255 times 10^{-35} m), is equal to the minimum radius and forms the smallest possible black hole. However, because it is only conceivable that these 2 energy quanta revolve around a common center of gravity, The requirement of the non-rotating case of the Schwarzschild metric no longer applies, but the Kerr metric must be used and the values can change by a factor of 20.5 (these investigations are still ongoing).

* Since the Planck mass is many powers of ten greater than all the masses of elementary particles and atoms, gravitation does not play a role there according to the Schwarzschild metric. These smallest possible black holes have all the properties that are known so far from dark matter, this means they have a large mass, but due to their extremely small size (r_S in the order of a Planck length) do not interact with normal matter and can only have arisen in a limited ultra-high energy density range during the Big Bang.
* They make up dark matter.