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The Gaussian Plain and Symmetry : The Generalization of the Differential Equation of the 2nd Order

By

Roland Meissner
e-mail: rolandmeissner@gmx.de

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Abstract- Tree basically different types of symmetry can be deduced from the Gaussian plain: the ±symmetry, the ${}^{1}{}_{i}{}^{s}$ymmetry and the ${}^{D}{}_{i}{}^{s}$ymmetry as well as two different singular points, one with content and one totally empty.By introducing a complex number as parameter into the differential equation of the 2nd order, it is continuously extended onto the entire Gaussian plain. There is both, a world formula and a theory of everything

Keywords: Gaussian Plain, General Field Theory, TOE, Spherical-hyperbolic Symmetry

1 Introduction

This paper's main thesis is that circle and hyperbola form a unit: Where there is a circle is also a hyperbola and vice versa, where there is a hyperbola is also a circle. Unit circle and unit hyperbola have in common that they do not go through the origin of the ordinates. If you turn the apex of the unit hyperbola 360° around the origin of the ordinates, you always get a unit circle. This hypothesis holds also for the Riemann-space and the Lobachevsky-space.

As we know from *A. Einstein's* theory of relativity, a mass causes a space warp. Respective experiments showed that we can assign this curvature of space to the hyperbolic Lobachevsky space (angular sum within the triangle amounts to less than 180°). Furthermore, it is shown that you always have to assign a hyperbolic Lobachevsky-space to a spherical Riemann-space (sum of all angles within the triangle larger than 180°), whereby the Riemann-space has to be considered as being the origin of the Lobachevsky-space.

It is assumed that one knows about the theory of numbers, including the Gaussian plain, conic sections, Euler's formula and the respective theories of physics, theory of relativity, quantum mechanics, standard model, string theory, big bang hypotheses and so on. The conclusion is drawn that there are basically three types of symmetry: the ±Symmetry, the ${}^{1}{}_{i}{}^{s}$ymmetry and the ${}^{D}{}_{i}{}^{s}$ymmetry. Furthermore, the theory of everything is being formulated: The theory of gravitation is an imaginary quantum theory and vice versa, the quantum theory is an imaginary theory of gravitation.

2 The Spherical-hyperbolic Symmetry (${}^{1}{}_{i}{}^{s}$ymmetry)

We provide the thesis that the Lobachevsky space (hyperbolic gravitational field) is caused by a Riemann space (globular mass) and that these two together compensate one another and form a Euclidian space, if the origin would disappear. According to that, the Riemann and the Lobachevsky space form an inseparable unit which can be reconciled under the term "spherical-hyperbolic symmetry". There is no literature available yet about the issue of spherical-hyperbolic symmetry. First approaches can be found from *F. Klein* [1].

This work has been forgotten and can not be found in the university library. The only proof was detected in the German Library, Leipzig. *F. Klein* examines *geometrically* that you can gain all kind of conic sections via reflections at the circle. At this point, the problem is solved *analytically*. For the development of spherical-hyperbolic symmetries, we have the following initial phrases:

The sum of all infinitely distant points appears as a mirror image of the center of the sphere if the position is outside the sphere. Is the position inside the sphere, the center of the sphere is the mirror image of all infinitely distant points.

You can develop the spherical-hyperbolic symmetry if you take the whole Gaussian plain into consideration. Therefore, we can formulate the following theorem:

The circle is an imaginary hyperbola and vice versa: The hyperbola is an imaginary circle.

This theorem is easily proved. Given is the equation of the circle

$$y^2 + x^2 = 1 \qquad \text{(Equation: 1)}$$

and the associated hyperbola

$$y^2 - x^2 = 1 \qquad \text{(Equation: 2)}$$

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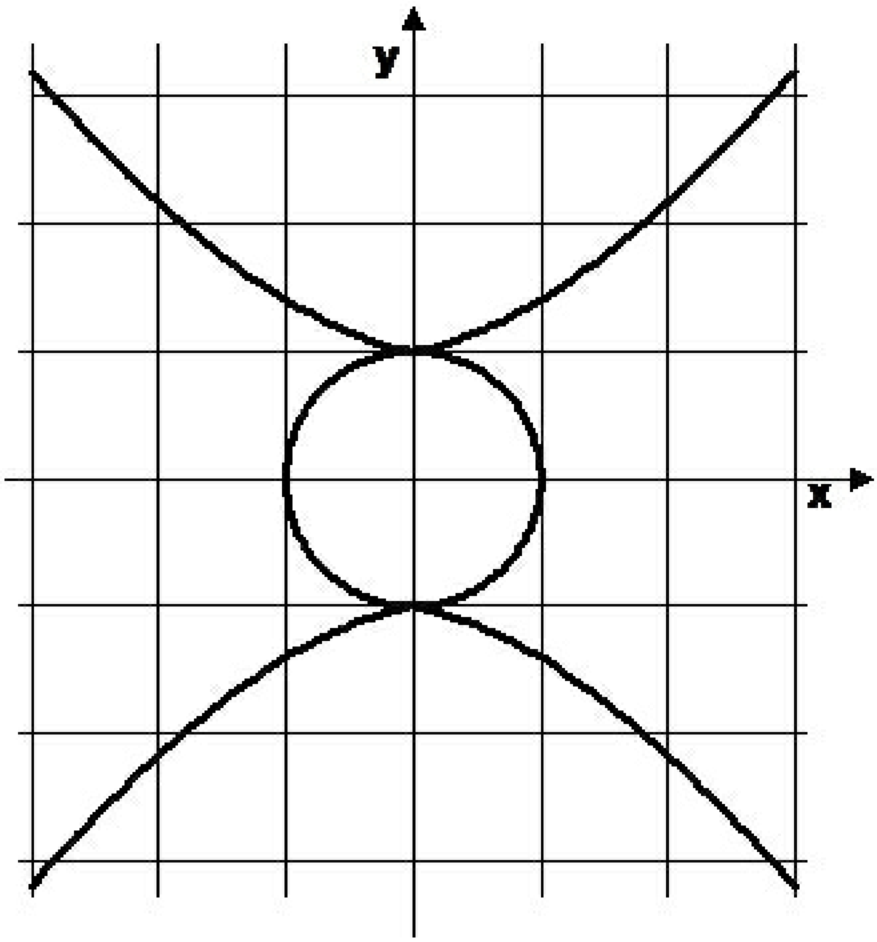
Figure 1 Illustrates the Associated the Unit Circle and Hyperbola.



If we now put

$+1 = -i^2$ ($i = +\sqrt{-1}$ imaginary unit) and $-1 = +i^3$

we get for the imaginary hyperbola:

$$y^2 - (ix)^2 = 1$$

(Equation: 3)

and for the imaginary circle:

$$y^2 + (ix)^2$$

(Equation: 4)

You can see that the hyperbola's apex constitutes a point on the circumference. If you turn the hyperbola's apexes around the origin of ordinates, the circle appears as a result. For the imaginary hyperbola and the imaginary circle we get, with *ix* as ordinate, the same picture as above, only that circle and hyperbola have been interchanged, which you cannot see, however. Exactly this is the core of the spherical-hyperbolic symmetry.

As you can see, the ± symmetry turns into a $^{1}_{i}$symmetry. Let us now have a look at the symmetry of differential equations. Given are the symmetrical differential equations of the 2nd order:

$$y'' \pm y = 0$$

(Equation: 5)

with the solutions:

$$y_+ = C_1 e^{ix} + C_2 e^{-ix}$$

(Equation: 6)

And

$$y_- = C_1 e^{x} + C_2 e^{-x}$$

(Equation: 7)

If you transform these equations by using EULER's formulae[1], you receive the common spelling for the real solutions of (5) with different constants like stated above:

$$y_{+} = C_1 \cos x + C_2 \sin x$$

(Equation: 8)

And

$$y_{-} = C_2 \cosh x + C_2 \sinh x$$

(Equation: 9)

The cyclic functions derive from the circle, the hyperbolic functions from the hyperbola. You can see that solutions (6) and (7) blend into each other because of a rotation of $\pi/2$ in the Gaussian plain. If you follow the analysis right to this point, the generalization of the differential equation 2nd order is not far to seek.

3 The Generalization of the Differential Equation of the 2nd Order

You get this generalization if you introduce the parameter *p* and spread it over the whole Gaussian plain. You get:

$$y'' - py = 0$$

(Equation: 10)

With

$$p = \varrho^2 (\cos\varphi + i \sin\varphi)^2$$

(Equation: 11)

You can see that if $\varphi=0$

$$y'' - \varrho^2 y = 0$$

(Equation: 12)

The solution includes the hyperbolic functions according to (9). In case of $\varphi=\pi/2$ you get

$$y'' + \varrho^2 y = 0$$

(Equation: 13)

At this point, the solution includes the cyclic functions according to (8). For the other angles φ left, you get the complete combination of cyclic and hyperbolic functions:

$$y = C_1[\cosh(\varrho\cos\varphi)\cos(\varrho\sin\varphi) + \sinh(\varrho cos\varphi)\cos(\varrho sin\varphi)] +$$
$$C_2[\cosh(\varrho\cos\varphi)\sin(\varrho\sin\varphi) + \sinh(\varrho cos\varphi)\sin(\varrho sin\varphi)]$$

(Equation: 14)

I would like to draw attention to the following problems which are not even mentioned in literature. For being able to differentiate equation (14) correctly, you have to transform cyclic and hyperbolic functions into exponential functions with other constants by using EULER's equations. Furthermore, you have to set q=0, =0, $\pi/2$, π, $3\pi/2$ into the initial equation. If you set in these figures into the solution, you will get a different result. The complete combination of cyclic and hyperbolic functions, as stated above, is the fundamental mathematic skeleton of the theory of everything that we are searching for, because with this general solution, *all* numbers of the Gaussian plain are captured. There is a need to criticize the way the differential equation of the 2nd order has been hitherto handled.Up to now, only the cyclic part has been used in developing quantum theory. The hyperbolic part is however ignored, which is a fatal mistake. If the theory of gravitation is adjusted to this hyperbolic part, you get one, and only one, equation that is able to describe all interactions. This then is the world formula we were looking for.

4 the Dialectic of the Function of Potential (Gravity) and the Wave Function (Quantified Electro Dynamics)

The adaption of the differential equation of the 2nd Order (TOE) to gravitation will be made as follows: Given is the differential equation of the 2nd order in its simplest form

$y'' \pm y = 0$

(Equation: 15)

Out of the spectrum of solutions, the following will be chosen:

$y_{+} = \cos x$

(Equation: 16)

for the wave function and

$y_{-} = \cosh x$

(Equation: 17)

for the potential function.The wave function can be left like this, but the potential function has to be brought to its normal form using transformations of coshx. At first, one can determine that coshx is a hyperbola with asymptote e^x (a curved asymptote) because

$\lim(x\to\infty) 2\cosh x = e^x$

(Equation: 18)

This fact should have already been noticed by EULER and has ever since been missed by millions of calculus teachers.Now, apply the circle

$\cos^2 x + \sin^2 x = 1$

(Equation: 19)

and the hyperbola

$\cosh^2 x - \sinh^2 x = 1$

(Equation: 19a)

These equations will be straightened out using

$y^2 + x^2 = 1$

(Equation: 20)

for the circle and

$y^2 - x^2 = 1$

(Equation: 21)

for the hyperbola.

Now, these are the same equations for the circle and the hyperbola as seen above (...) with the corresponding image. This picture is to be turned by 45° or π/4.

According to the usual transformation rules you get for the circle without any changes

$y^2 + x^2 = 1$

(Equation: 22)

But for the hyperbola

$y = 1/2x$

(Equation: 23)

In this form the circle and the hyperbola have a common point if the radius vector is to be turned by 45°. This has consequences for the common tangential line which likewise has to be turned by 45° resulting in a right angle to the radius vector. This tangential line describes the axis of the spherical-hyperbolic symmetry. We get for the common tangential line.

$y = -x + \sqrt{2}$

(Equation: 24)

Then, the common point is

$P(x,y) = (\sqrt{2})/2$

(Equation: 25)

Equation (23) is an asymetrical potential function and equation (22) is a symmetrical wave function.

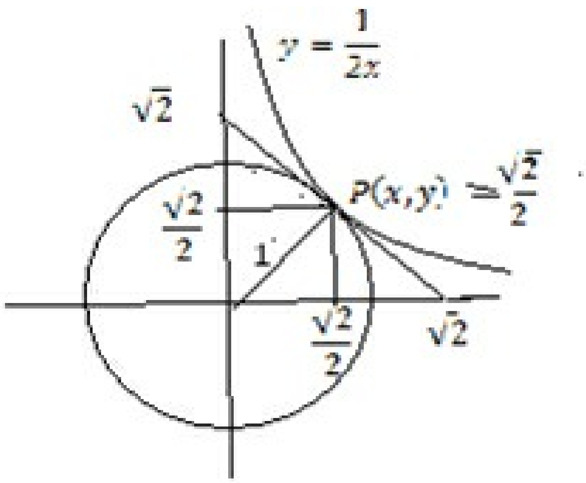


FIG. 2: the potential function (hyperbola) and the wave function (circle) with its common point and its common tangential line

The potential function corresponds to the gravitational potential. Now, we can write;

$P_G = G_N(Mm/r)$

(Equation: 26)

The gravitational potential has to be asymmetrical because no negative mass exists. (condition for a potential function) With very very small r (a magnitude of 10^{-15} m) the gravitational potential leaves the potential function and becomes constant (see [2]).Therefore, it is guaranteed that you can derive the gravitational potential from the differential equation of the 2nd order – the Theory of Everything. In contrast to the gravitational potential, the potential of COLOUMB is no potential function because it has negative and positive charges and therefore is symmetrical (meaning not distinct; distinctiveness is a requirement of potential functions). Therefore, there is no infinitely small potential between two charges (zero potential). The Law of COULOMB

$P_C = \pm(Qq)/r$

(Equation: 27)

Only applies from r=a until r=b hence is completely different from the gravitational law. The gravitational potential can become infinitely small. There is no single charge because of the principle of electro-neutralisation. Therefore, there is no zero potential. There are only potential differences. The law of COLOUMB rather complies with the differential equation

$y'' + (2/x)y' + y = 0$

(Equation: 28)

That is the differential equation of a stationary circular wave with one solution

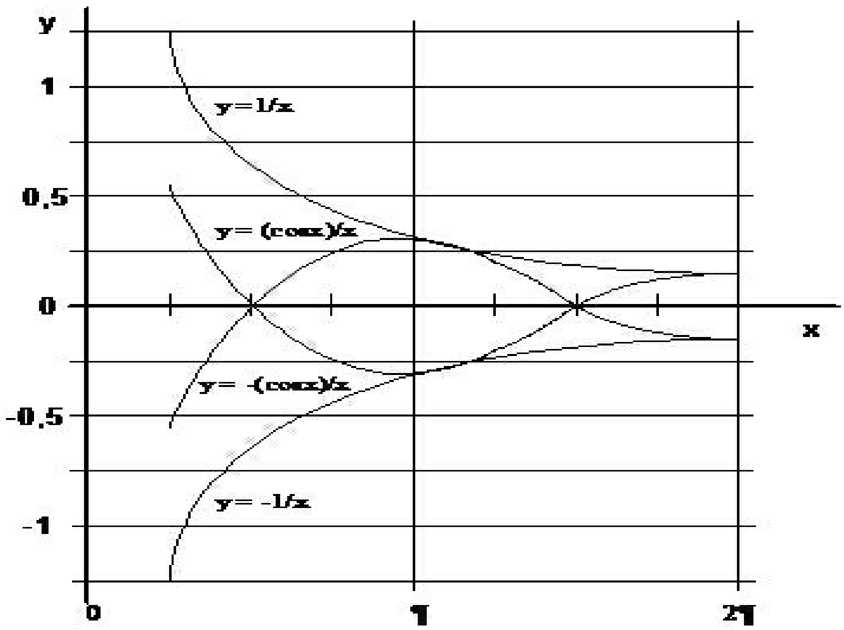
$Y = \pm (\cos x)/x$

(Equation: 29)

Therefore, the potential of COULOMB is a wave function.As a result, gravitation and quantified electro-dynamics are two completely different aspects of nature. They differ qualitatively and don't have anything to do with the theories that want to induce a quantitative accord of the two phenomena of nature which are the String Theory and the Loop Quantum Theory. On the basis of these theories, whose approce is purely formally logic, it is impossible to find the Theory of Everything. These theories are from the beginning onwards unreal. In spite of the different qualities of said phenomena, both are derived from the same formula – the differential equation of the 2^{nd} order. In figure 2, the General Field Theory is summed up in its simplest form. The hyperbola symbolizes the whole Theory of Gravity while the circle sums up the whole quantum electro dynamics including the weak and the strong interaction and the quantum chromo dynamics. It fits on a t-shirt as it is desired by physicists, so the press says. There, in point P(x,y), all three big sciences meet. Math, physics and philosophy.

FIG 3 : Image of the potential of COULOMB as a wave function

If you connect the amplitudes of the cosinus you receive two hyperbolas. In their common point Gravity and Quantum Electro Dynamics can interact. Hence, it is not impossible that light emits energy into the gravitational field in form of friction (red shift). This energy appears as cosmological radiation. In the following, the red shift is larger at the time if the observer is further away from the object which matches the experimental results. Therefore, the Big Bang hypothesis is from the beginning onwards unreal.If the redshift is not or only partly attributed to the Doppler effect one can assume an infinite cosmos.



5 The analysis of the 5 Gaussian plane

The further analysis of the Gaussian plain reveals the different symmetries in one simple scheme. You put

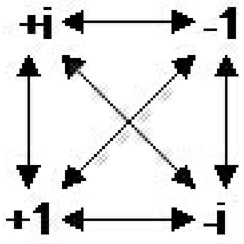
$$y(n) = i^n$$

(Equation: 15)

(n – natural number).

You receive: $i^1 = +i$, $i^2 = -1$, $i^3 = i^1$, $i^2 = -i$, $i^4 = i^2$, $i^2 = +1$, $i^5 = i^1$, $i^4 = +i$ (repetition).

Thereof, you get the following scheme:



Scheme I

At this point, the diagonals reflect the commonly known symmetry, which is also known as gimbal symmetry. The $^{1}_{i}$^{s}ymmetry is created and expressed by verticals and verticalness.

If you write

$$y(n) = i^{-n}$$

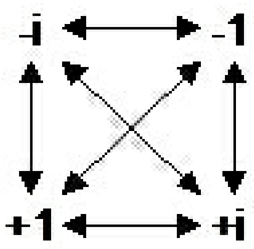
(Equation: 16)

$$\frac{1}{i} = \frac{I}{i^2} = -i,\ \frac{1}{i^2} = -1\ \frac{1}{i^3} = \frac{i}{i^4} = +i\ \frac{1}{i^4} = +1$$

$$\frac{1}{i^5} = -i$$

(Repetition)

You receive a minimally modified scheme:



Scheme II

+i and *-i* are interchanged at this point. Because of a rotation in the plane, both schemata will never be congruent. In the first diagram you move from *+i* to *+1* by turning right, in the second diagram by turning left. So you can distinguish between right and left. This type of symmetry is called *chiral*. According to the spelling stated above, this is the $^{D}_{i}$^{s}ymmetry. The spherical-hyperbolic symmetry is thus no hypothesis, but the necessary filling for a gap in the scheme above. Now it still needs to be clarified what i^0 means. i^o=1 is a singular point with content (the singular point without content is discussed beneath). One example for such a singular point is the parabola for instance. The parabola can be considered as depraved ellipse which has infinitely distant focal points, so that only *one* focal point is available. Besides, the parabola has no partner (single) unlike circle and hyperbola, because when dealing with $y=x^2$, $y=(ix)^2$ is the reflection of itself (plane reflection symmetry). (It should be noted that the plane reflection symmetry is a special case of spherical-hyperbolic symmetry, namely at $\rho\rightarrow\infty$ (ρ is the radius of curvature)). According to definitions, the integral parts of the ideal gas are singular points with content (point-shaped, no interaction between them, what is called chaos). In addition, we have the *amorphous* carbon black. At this point, the carbon atoms are singular points with content because they do not form any structure. In contrast, the pole is no singular point because it has its partner (no single) with the antipole. Concerning the discussion about the hypothetical, magnetic monopole, I would like to remark that according to the definition, it can not even exist. A magnetic field emerges if, and only if charges are moving. If a magnetic field shall emerge, at least *one* solution has to *move* from A to B so that it becomes *always* necessary that a dipole develops. You receive an absolute, empty and singular point, if the circle's radius amounts to *r*=0. In that case, circle and hyperbola degenerate into co-ordinate axes of the Gaussian plain and the origin of ordinates becomes the absolute empty singular point.

To sum up, you can say that you can deduce three different types of symmetry from the Gaussian plain, the ±symmetry, the $^{1}_{i}$^{s}ymmetry and the $^{D}_{i}$^{s}ymmetry as well as two different types of singular points.

6 Suggestion for The Formulation of the Theory of Everything (TOE)

When *Einstein* was working on gravitation he wanted to reconcile gravitation with electricity and thus create a general field theory. Today, we know that the quantum theory (electrodynamics) is represented by cyclic functions and the theory of gravitation by hyperbolic functions. It therefore had to be examined what circle and hyperbola have in common and how they differ. This has been done here. In adaptation to the above theorem (see page 88 at the top), the qualitative formulation of the theory of everything is:

The theory of gravitation is an imaginary quantum theory and vice versa, the quantum theory is an imaginary theory of gravitation.

Both exclude each other. That means that the hyperbolic gravitational field is continuous and is not allowed to be quantisized, what matches the experimental findings (there is no negative mass, for instance, and therewith no mass oscillator which can produce waves that could be relevant for the quantum theory).

But both have been welded together by the $^{1}_{i}$^{s}ymmetry. Transformations are possible (e.g. rotations in the Gaussian plain; also see the EULERian transformation formulae). Concerning the quantitative structuring of the definition stated above, all theories have to be checked to find out, if they really fit into the above scheme. Actually, the theory of everything is a philosophical problem because the antique philosophical schools did already have controversial discussions about it, whether the world is constructed continuously or discontinuously. In the newer ages, *Dalton*, who proved that chemical elements existed, postulated the thesis about the world being continuously constructed in a discontinuous way. *Einstein* however, proceeded on the assumption that the world is continuously constructed. He disliked the discrete quantum theory that is built upon the calculus of probability. Currently, there are efforts made again to quantize the gravitational field as well. Like all one-sided efforts, this is also not the right way. The world is just made of contrasts which you can unite usefully like it occurred above.

7 Discussion

Symmetries and singular points play a central role in physics. Since the Gaussian plain evidentially displays a reality-oriented mathematical abstraction, we can proof the multitude of physical theories with regard to their correspondence to reality and sort out pure abstract-theoretical fantasies which can be rather assigned to art than to science, all on the basis of the facts that we affiliated above. Such abstract-theoretical fantasies include, for instance, the n-dimensional Hilpert spaces and the Minkowski space. The big bang model has been proved in its origin by the author with regard to its correspondence to reality. (see [2]). In the Big Bang model – which is disproven here - we emanate from the hypothesis that according to Newton's gravitational law

$$\vec{F} = \frac{mM\vec{r}}{r^3}$$

(Equation: 17)

A singular point does exist in r=0 from which the world has evolved. At r=0 we reach the origin of ordinates and we should have to deal with an absolutely empty, singular point which, in our case, is filled up with an endlessly large force. According to the above figure, this is paradoxical and unreal. Furthermore, we reach velocity of light at l=0 according to the special theory of relativity and time becomes infinitely great. Such a point would then have to remain for ever end ever in the same state and could not develop in any way. All these inconsistencies can be erased on the basis that we developed above. Starting from the acceleration's limitation, the following formula (x_0 ca. 10^{-15} m) is deduced in [2] for the origin of ordinates' direct surrounding (see [4], page 12).

$$y(x) = \frac{x_0^2}{x^2}\sqrt{1-\frac{x_0^2}{x^2}} + \frac{x^2}{x_0^2}\sqrt{1-\frac{x^2}{x_0^2}}$$

(Equation: 18)

This formula includes the conic sections circle, parabola and hyperbola. It also includes two singular points, one at x=0 (origin of ordinates) and one at $x=x_0$. The integration provides a further result in the point $x=x_0$. Equation (18) consists of a real and an imaginary part which blend into each other in case of a continuous modification of x ($^{1}{}_{i}{}^{s}$ymmetry). The $^{1}{}_{i}{}^{s}$ymmetry (contradiction) is responsible for movements in the cosmos. Some physicians believe that you can solve all problems of physics with the theory of everything. The formula above however does only solve the relation of continuity and discontinuity. In miniature, the world is discreet; en masse it is continuous because of the omnipresent gravitational field. With the "formula" above, *all* numbers of the Gaussian plain can be captured. It is thus complete. Those, who want to solve *all* kind of problems with the help of the theory of everything, will be disappointed by the simplicity of above formula. But there are also scientists who seek to simplify the illustration of nature's relations. Those will be totally satisfied. After the proof in the first part, that acceleration is limited, you have to check the whole physics anyway, starting from the laws of force.

8 Conclusions

1. It is shown that circle and hyperbola form an antithetic, but inseparable unit.

2. Tree basically different types of symmetry can be deduced from the Gaussian plain: the ±Symmetry, the $^{1}{}_{i}{}^{s}$ymmetry and the $^{D}{}_{i}{}^{s}$ymmetry as well as two different singular points, one with content and one totally empty.

3. The $^{1}{}_{i}{}^{s}$ymmetry is responsible for movement in the cosmos and can neither be created nor destroyed.

4. The Differential equation of the 2nd order is the world formula from which all kinds of interaction can be derived

5. The dialectic of potential function and wave function is being illustrated. It is shown that the gravitational potential is a potential function and the COLOUMB function is a wave function.

6. The String Theory and the Loop Quantum Theory are being disproved. They are wrong from their premises. With these theories it is impossible the find a General Field Theory.

7. It is being discovered that curved asymptotes exist. The curved asymptotes are the key to the General Field Theory

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