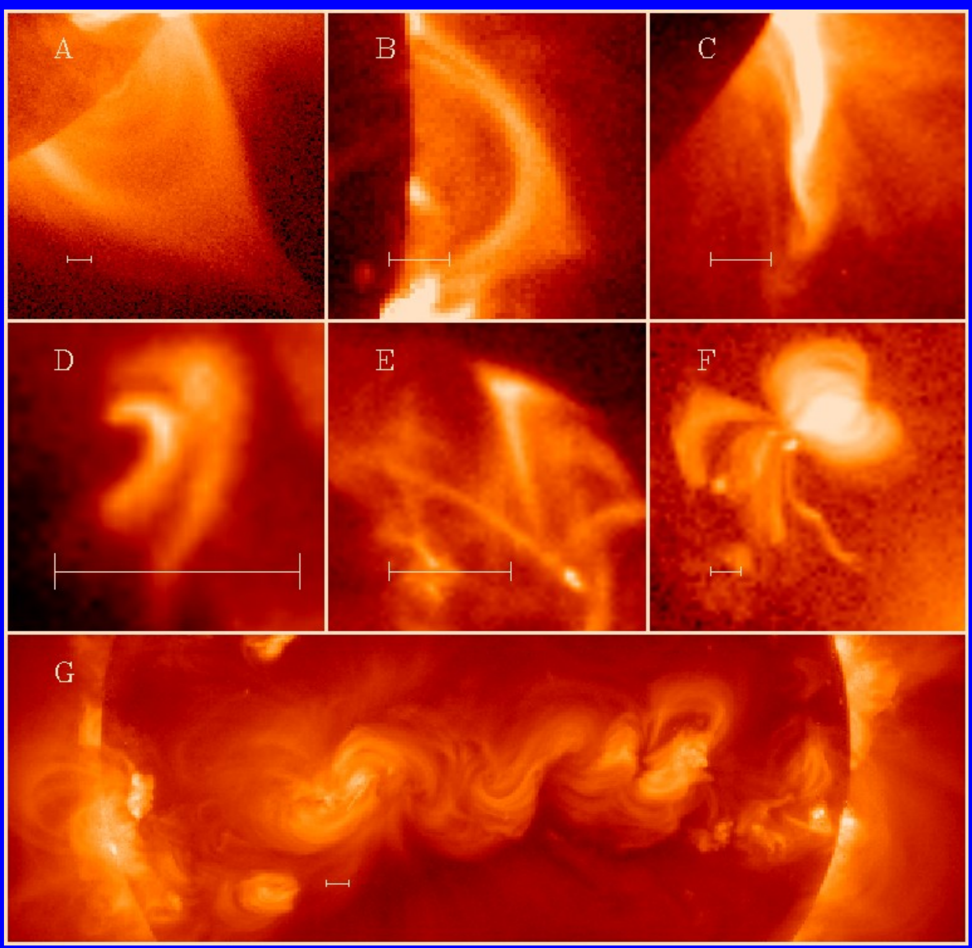
Thierry De Mees

The Solar Protuberance Theory
-
Our Solar System and the Planetary System Creation



Gravity Beyond Einstein

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Description of the picture on the front page:

Menagerie of loops

The images shown were obtained from the Soft X-ray Telescope (SXT) on the Yohkoh solar research spacecraft from October 3, 1991 to January 25, 1992. This particular selection is described in the article "The Yohkoh Mission for High-Energy Solar Physics", by L. Acton, et. al., Science vol. 258 , 23 Oct. 1992 pp. 618-625. The images here were selected to exemplify a variety of solar coronal features seen in soft x-rays.

A. Large Helmet type structure
B. Arcade of x-ray loops seen end-on
C. Dynamic eruptive which grew at a velocity of about 30km/sec
D. One of many small symmetrical flaring loops seen by SXT
E. Two cusped loops with heating in northern loop
F. Tightly beamed x-ray jet toward southwest at 200 km/sec
G. The sinuous magnetic connection between active regions

Gravity Beyond Einstein

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INTRODUCTION

It is a widely accepted misconception that the solar system would have been created by the collapse of nebulae around the solar region, just as our galaxy itself.

Where this is true for the stars in the galaxy, this is definitely wrong for our planetary system.

Indeed, many stars in our galaxy were created during the formation of our disk galaxy out of a regular, spherical or elliptical galaxy, due to the angular momentum of the galaxy's center, which contains fast spinning stars and black holes. This process has been extendedly explained in my book “Gravitomagnetism - including an introduction to the Coriolis Gravity Theory”. The disk was compressed by the angular gravity of the galaxy's center, a second gravity field on top of Newtonian Gravity. The smaller and colder parts were able to clump together and heathen up by that compression. Elsewhere, voids were created that way, and a heterogeneous disk, as our spiral disk galaxy shows us, could form.

The difference between the solar system creation and the galaxy creation is enormous. Where we find numerous stars in the galaxy on the same orbit or at close orbits, our solar system counts only nine (or, more correctly: eight) planets, which orbit very far from each-other. Moreover, on each orbit or nearby it, there are no other planets nor objects. The only place where other objects are found is on the asteroid belt and, as an extension of that belt, a number of asteroids, called Trojans, on Jupiter’s orbit.

The nebula theory has numerous unsolved problems. The very existence of the Trojans prove that asteroids doesn’t just go away or aren’t just absorbed by the planet of (or near) an orbit. At the contrary, one should then find several planets on the same orbit, and remaining asteroids from the nebula. The diversity of the planets’ spin orientations is another problem. More problems arise regarding the big difference between the set of core planets and the set of gas planets. Nothing in the nebula theory can explain the differences of spin either.

In this little book, the reader will find numerous arguments in favor to a totally different point of view: the planets all come from an electromagnetic solar explosion. The reason of the existence of a set of four core planets versus the set of four gas planets will be explained, and why their masses, as groups, are related like the mass quotient of a proton versus an electron. Jupiter’s spin rate will be explained and the orientation of the planets’ spin as well. Also the orbital distance between the planets can be explained with very high probability.

In a few moments, the reader will discover this fresh Solar Protuberance Paradigm, enriched with a multitude of evidence. Enjoy the reading!

1

Fundamentals of the Solar Protuberance Model and evidence from the Gas Planets

The Sun possesses a gigantic energy, which is embedded in the bound and unbound protons and electrons that it contains. The energy that escapes from the Sun is only made from atomic binding energy and doesn't even alter the protons and electrons, apart from the creation of neutrons, which on their turn are again protons and electrons. It needs only a small energy to blow out the total mass of our planets, and that mass is but 0.2 % of the Sun's mass. These are the fundamentals of the Solar Protuberance Theory.

My first paper, written in January 2005, was a primary attempt to catch that idea, in the sense of a solar eruption. A strong evidence is found through the kinetic and thermal energies of a solar eruption process.
After this first paper, I realized that the eruption must have been electromagnetic and I explain that process in the second paper, whereby I prove with a very high probability the origin of the orbital sequence and the mutual distances between the planets.

Part of the explanation lays in the fundamentals of Gravitomagnetism, which lead to the requirement of only prograde orbits, but also to the mechanism that achieves that. If the reader is interested to enter more in dept about Gravitomagnetism, he should avoid reading mainstream interpretations such as the so-called “Linearized General Relativity Theory”, because they have nothing common with true Heavisidian Gravitomagnetism. My first book “Gravitomagnetism” and my very first paper on the subject are the easiest approach to the subject, full of real examples from the cosmos.

Enjoy the reading!

Are Venus' and Uranus' tilt of natural origin?
or
On the formation of our planetary system.

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Summary

The formation theories of our solar system have still remained filled of question marks.
Why are the orbits of Mercury and Pluto that much eccentric, and that of the other planets much less? Why are the axial tilts what they are? This we will discover in this paper. Here we will start from the primary model of a huge solar protuberance and next apply the electromagnetic and the gravitational dynamics to it. The application of these physics leads us to the description of how the planets arose, their orbits, their tilt, and their composition. Also we will comment why the Asteroids Belt and the Trojan Asteroids probably arose.

Initially, we will bring in that the complete planetary system originated from a solar eruption, and reveal that the planets have successively developed in the order : Mercurius, Venus, the Earth, and Mars on the one hand, and on the other hand Neptune, next Uranus and probably Pluto, then successively Saturnus and Jupiter. At last, the Asteroids Belt was formed, just after the formation of Mars and Jupiter. This theory is supported by the other parameters such as the comparison of the planet's density, size and chemical composition. Also the comparison of their tilt, the spacing between their orbits, and the elliptic orbit and tilt of some planets support the theory. We find evidence that Venus' and Uranus' tilt are totally natural.

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1. A plausible starting point: the solar eruption cloud.

Some formation theories about our solar system. – *The planets emerged from a local cloud*

Has our planetary system arisen from a collision between the sun and another object? An almost-collision? Is a huge sun eruption the origin of our solar system? A separation of a part of the sun? Do the planets come from an alignment out of an interstellar nebula? Different theories will prefer the one or the other cause, more or less founded. So far no proof has been provided which can exclude all theories with respect to another.
Actual theories in literature start from a solar nebula becoming a ring with whirls, due to a turbulent compression of the nebula into a disc cloud. These whirls are then supposed to form the planets. But nor the origin of the compression nor that of the whirls however are explained in a convincing way.

Let us choose as origin of the planets, a solar eruption, although solar eruptions generally are limited in size. The total mass of all the planets is just one fraction (0,1%) of the sun's mass. We will see that the choice of the eruption type is not unimportant, but we provisionally start with a hot cloud.

The first question concerns the position of that cloud around the sun. Since only a few planets arouse, rather consistently spread in the space near the sun, the provenance could be a solar eruption cloud, which did not wander around the whole sun, but which was only present in a limited area. There is in fact only one planet per orbit, and the orbit lie on regular distances of each other, as follows from the empiric Titius law:

$a = 0{,}4 + 0{,}3 \,.\, 2^n$ where a is the semi major axis in (AU) and the exponent n, takes values 1, 2, 3, ...

Other examples of contracting clouds showed symmetric evolutions. We have also seen in *"Lectures on: A coherent dual vector field theory for gravitation"* [2] that plane galaxy systems convert themselves into spiral systems; in *"Cassini-Huygens mission"* [4] we saw how the Saturn rings are converted into a range of mini-rings. But in these both cases the cloud has always remained symmetrical to the central mass, planet or bulge of the galaxy system. Whereas at our solar system an asymmetry must have been arisen.

A cloud nearby the sun. – *Minimum conditions*

How can the solar eruption cloud have looked like? It is surprising that the planets eventually describe a circular or an elliptic orbit. And it is also unexpected that there only exists one planet per orbit region.

In order to combine all conditions which would give a chance for the formation of such a planetary system, the minimum requirements are the following:

(a) it concerned a huge local solar eruption *(b)* in which already all types of atoms were present.

The eruption (*a*) caused the ejection of matter, about 0,15 % of the sun's total mass, at a speed above the escape velocity of the sun. The cloud with a vaporised heavier core (*b*) could escape from the sun's attraction by means of the eruption force, while the pressure of the erupted gasses arranged a large spacing of the cloud.

While after the eruption the cloud is, in a whole, blown further away by the gas and the vapour pressure, the heavier particles will occupy a less extended area. The gasses continue expanding more easily, and will remain farther away than the other particles do.

Consequently our model forms an excellent basis for a planetary system such as ours: a small number of planets, broadly spread, with one per orbit region, describing circular prograde orbits. Of course provided that the further formation itinerary can be explained.

A certain number of phenomena must still be explained: Mercury and Pluto have got an elliptic orbit, and Venus and Uranus got a very different tilt from the other planets. Couldn't Pluto not be an adopted planet? Has the tilt of Venus and Uranus not been changed by a huge collision? Can we explain all the other macroscopic properties of each planet? These very pertinent questions have fairly good solutions, thanks to the Maxwell analogy for Gravitation.
Hereafter we see how all this is fairly compatible.

2. The electromagnetic solar eruption model.

Solar flares, post-flare loops and prominences. – *A huge prominence as model*

The description of the magnetic properties of the sun can be found in the literature. The sun becomes active near sunspots, and those sunspots are principally found in pairs, with a magnetic north pole and a magnetic south pole. When mass ejections occur, at very high temperature, the ionised hydrogen and the electrons follow a magnetic path which quit one sunspot pole and goes to the other pole, creating so a magnetic buckle outside the sun's surface.

Solar flares and post-flare loops are very common events at the sun's surface. Prominences, which reach further from the sun's surface are common as well. All these phenomena are provoked and maintained in suspension by the magnetic fields of the sun.

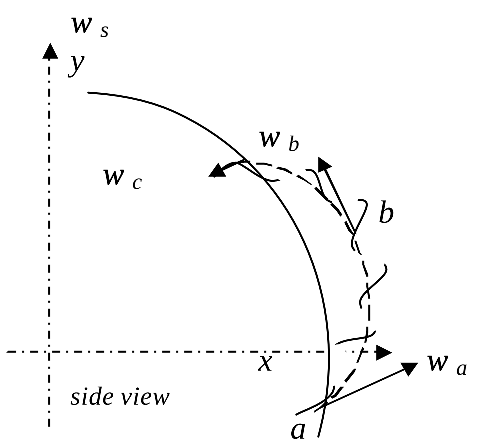

fig. 2.1 : Solar protuberance.

So many different eruptions can take place that in the meantime we simplify our eruption model. Let us consider an exceptionally huge prominence (eruption) that follows a magnetic field path. Positive hydrogen ions will erupt from point a while rotating screw wise along the magnetic line along point b to point c. Electrons will flow contrariwise. When we take the tangential velocity into account, the equation (2.2), see lower, is at the origin of the spiral screwing cloud along the magnetic field path,
This gives a rotation w which changes of direction at every point of the prominence, but their direction change also with the sun's axis-symmetric angular position.

After some time, the guiding magnetic field falls away, so that the cloud expands without changing the local directions of w anymore.
How will this cloud evolve?

Dynamics of the erupted cloud. – *Electromagnetism and Gravitation*

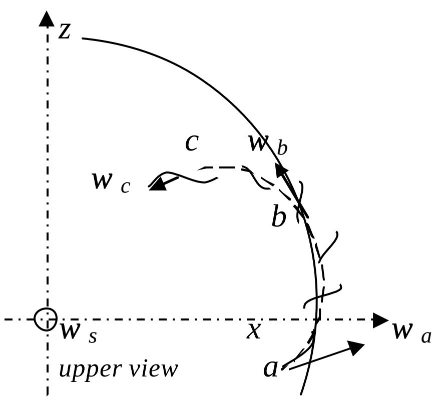

fig. 2.2 : Solar protuberance.

Drawing fig.2.1 shows the eruption, projected in the vertical plane. In the horizontal plane, a similar drawing can be made, fixating the rotation vector in the horizontal plane (see fig.2.2).

The global velocity of the rotating particles is directed along the magnetic field path. The velocity vector and the rotation vector are parallel in each location. Even when the magnetic field path felt away, both velocities were maintained.

An important fact is that due to the law (for low velocities) :

$$v^2 = GM / r \qquad (2.1)$$

where v is the tangential velocity in relation to the sun, a certain orbit position with radius r will be associated to every fraction of the cloud.

The radial initial velocity of point a is very probably far above the sun's escape velocity, while its initial tangential velocity is much lower. The final orbit radius of point a will therefore be very large. When the screwing hydrogen

cloud reached point c , much kinetic energy was gone (as will be demonstrated later in this chapter) and it is not sure if the velocity of point c will even reach the sun's escape velocity, or rather fall back towards the sun. The remaining part, enclosing point b , will be spread away over a large space. But we should take notice : due to the cloud's shape, the radial velocity of point a relative to the sun is much higher than that of point b . Hence, point a will not necessarily be the extreme point of the planetary system, due to their respective tangential velocities! Point a, which has a small tangential component, will stay closer to the sun than point b. Within a few lines we will clarify this behaviour, and validate it all throughout this paper.
When the guiding magnetic field path vanished, the corresponding vectors w maintained their angular momentum orientation.

The cloud expands not uniformly, and its shape becomes elongated. In fig. 2.3 we show the further evolution of the cloud.

The major part of the erupted cloud contained hydrogen ions and electrons that left the sun with high speed. This creates an electric field with an attraction force. The sun's magnetic field as well exerts a force, and both forces together can be written as an electromagnetic force $\boldsymbol{F}_{em}$:

$$\boldsymbol{F}_{em} = q\ (\ \boldsymbol{E} + \boldsymbol{v} \times B\ ) \qquad (2.2)$$

where v is the speed of charge q, the electrical field is $\boldsymbol{E}$, and the magnetic field is B .

Equation (2.2) causes several effects. We know that the tangential velocity component is responsible for the screwing motion; the radial component is causing another effect: Depending of the sun's magnetic polarity of that moment, the radial expanding cloud will undergo a prograde or retrograde swing. This means that the radial expulsion velocity will contribute to the final tangential velocity, and so, the orbit radius. Hence, it is possible that point a is not the farthest point.
The cloud will also be pressed to the neutral magnetic equator of the sun[1], this is the plane in the middle of the two poles. Indeed, only when the tangential velocity of the cloud is perpendicular to the sun's magnetic field lines, no forces will act on it but a radial one. The most stable place is the sun's magnetic equator.

The electrically neutral particles of the cloud will not undergo such forces. Another force however, much less important, can still play a role.
As we know from *"A coherent dual vector field theory for gravitation"* [1], not only gravitation induce forces, but each motion of objects as well is transmitted by gravitation towards other objects, resulting in a force. We call the corresponding field *gyrotation field* W , and the resulting gravitomagnetism force F_{gg} responds to :

$$\boldsymbol{F}_{gg} = m\ (\ \boldsymbol{g} + \boldsymbol{v} \times W\ ) \qquad (2.3)$$

where v is the speed of mass m, the gravitation acceleration is written as $\boldsymbol{g}$, the so-called *gyrotation field* as W . The gyrotation field is defined by the motion of another mass in a local gravitation reference field.

The sun's and the galaxy's rotation is transmitted by gravitation into gyrotation forces which are responsible for two effects. The first effect of the sun's and the galaxy's rotation is that the escape velocity of the cloud, combined with gyrotation, will provoke a prograde swing of the cloud according (2.3).
The second effect of the sun's rotation is that the gyrotation force brings the cloud in the equator plane of the sun, and maintains the cloud under pressure.

The order of magnitude of (2.2) versus (2.3) is very different, so is the time needed to get a noticeable effect by the latter one. We should keep in mind that even if only a small percentage or a fraction of the cloud is ionized, it might contribute to an accelerated progress of the planets' formation. After time, when the ions disappeared, the latter forces became predominant.

In order to understand well the evolution from fig. 2.1 and fig. 2.2 towards fig. 2.3 and fig. 2.4 below, we must not forget that the angular momentum of each fraction of the cloud will remain the same from the moment that the magnetic guiding path of the cloud vanished. So, if we consider the eruption as many superposed screwing rings, the angular momentum of each ring remains the same, but the rings will slide the one over the other in order to get a broaden set of rings.

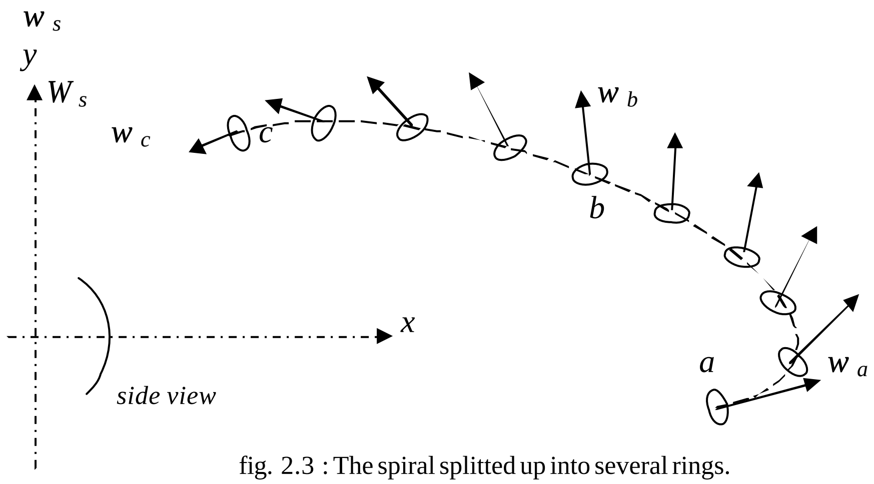

fig. 2.3 : The spiral splitted up into several rings.

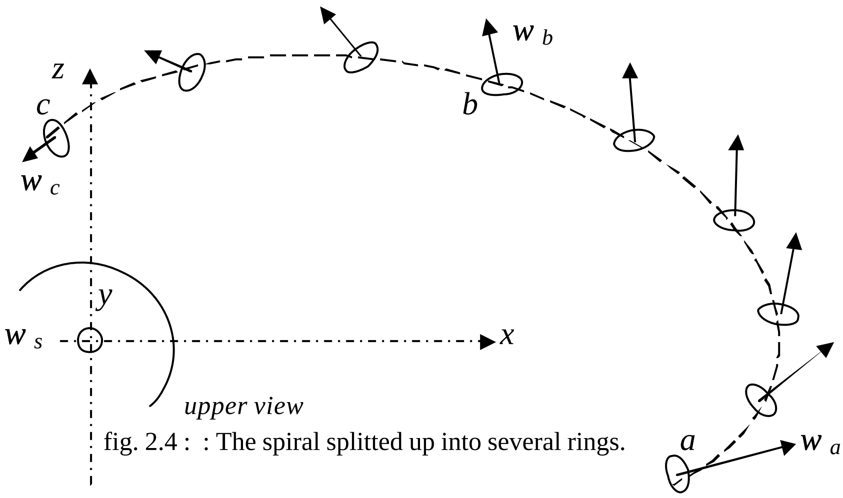

fig. 2.4 : : The spiral splitted up into several rings.

It is clear that every rotating ring will influence the rings close by, because the particles' velocities in the common border operate against each other. These particles can contribute in three kinds of effect: *(a)* due to collisions, push away the rotation centres of the several screwing rings; *(b)* group every set of two rings into a common ring with a larger diameter; *(c)* by annihilation of opposed speeds, create turbulent regions without rotation.

The general example shown in the drawings illustrate that a large region at both sides of point b has got a relatively constant tilt.

An important consequence of (2.2) is also that the screwing motion of the cloud will create an opposed induced field B that slows down the velocity, more and more while it moves on from point a to points b and c. At last, the extremity of the cloud is only screwing very vaguely. In addition, the globally scale-enlarging cloud acquired principally a tangential velocity in relation to the sun. Point c got the Mercury orbit speed of about 50 km/s. In next chapter, we will see that this apparently means the half of the initial speed of point a. In chapter 7 we will understand better the link between both velocities.

Does our model match the planets' parameters ? – The model fits with most of the planet's data

In table 2.1 are shown the major parameters of our planetary system. The comparison of the masses shows that the planets are in a logic order except for Mars and Pluto. In chapter 4 we will find reasonable explanations to this. Moreover, Neptune and Uranus should be inversed to match a logic order. Let us remind this for later.
The densities do not follow a very clear logic, because this depends from several parameters: the composition of the matter (kind and state: solid, vapour, or gas), the internal pressure of it, and the velocity-dependent external pressure caused by the sun and the galaxy, which we find out of (2.2) and (2.3). Hence, the density patters do not result in immediate conclusions concerning the model.

The axial tilt of the planets is given in the last line of the table. Very typical are the tilts of the Earth, Mars, Saturn and Neptune. These tilts increase steadily from 23,5° to 28,3°. On the other hand, the tilt of Jupiter is 3,1°.

Comparing these results with our model in fig. 2.3 , we see that the model shows a kind of protuberance which is not totally correct.

		SUN	MERCURY	VENUS	EARTH	MARS	JUPITER	SATURN	URANUS	NEPTUNE	PLUTO
Mass	(10^{24}kg)	1989000	0,33	4,87	5,97	0,642	1899	568	86,8	102	0,0125
Diameter	(10^3 m)	1390000	4879	12104	12756	6794	142984	120536	51118	49528	2390
Density	(kg/m^3)		5427	5243	5515	3933	1326	687	1270	1638	1750
Rotation Period	(hours)		1407,6	-5832,5	23,9	24,6	9,9	10,7	-17,2	16,1	-153,3
Distance from Sun	(10^9 m)		57,9	108,2	149,6	227,9	778,6	1433,5	2872,5	4495,1	5870
Orbital Period	(days)		88	224,7	365,2	687	4331	10747	30589	59800	90588
Orbital Inclination	(degrees)		7	3.4	0	1.9	1.3	2.5	0.8	1.8	17.2
Orbital Eccentricity	Eccentricity		0.205	0.007	0.017	0.094	0.049	0.057	0.046	0.011	0.244
Axial Tilt	(degrees)		0,01	177,4	23,5	25,2	3,1	26,7	97,8	28,3	122,5

table 2.1[8]

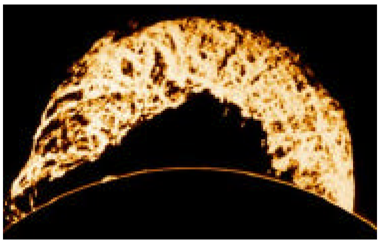

fig. 2.5[9]

fig. 2.6[10]

The planets Earth until Neptune, with the exception of Jupiter and Uranus, have tilts which vary very slightly. The protuberance that initially we thought alike fig. 2.5 seems to resemble much more fig. 2.6 : the points a and c in fig. 2.3 got a totally different tilt as the rest of the cloud. This would explain the slightly changing tilt of the planets Earth until Neptune. But we need to explain the tilt of Jupiter. We will attempt to solve this in chapter 6 when we analyse the consequences of the electromagnetic protuberance-model more in detail, especially the central part of the cloud.

The rotation period also represent an important parameter in order to compare the planetary system with the model. For the planets Earth, Mars, Saturn and Neptune, the rotation period is short. Jupiter has even the shortest rotation period. Very probably, our model has got the requested properties. The spin of point a is the highest, and decreases towards point c because of the energy losses between in both points. However, the tilt of the cloud fractions near point a , which constituted the proto planets Mercury and Venus, vary very rapidly from the one to the other angle. When fractions group towards a planet, the combination of different tilts will partly be transformed into thermal energy.
On the other hand, the tilt in Jupiter's region (point b) is quite the same, allowing Jupiter to rotate faster than the other planets.

The axial tilt of Mercury and that of Venus are not what we would expect with the model. However, their rotation period is that slow, that the theoretical prediction of the tilt is difficult anyway. Although the model shows a certain tilt (in fig. 2.3 it is 120°, but we know that the remaining rotation in point c is low and turbulent anyway), depending of the eruption shape and orientation, Mercury has an axial tilt of about 0° and Venus of nearly 180°. Considering Mercury's small mass and the extremely long periods of both planets, the global angular momentum of these two planets is negligible.

The tilt of Uranus is similarly 90°, because point *a* didn't reach the extremity of the planetary system. More likely, Uranus was predestined to reach the edge of our planetary system, according to our reflections about fig. 2.3.

Also table 2.2 gives support to this model. It is known that the solar activity depart from sunspots, or near sunspots. Sunspots are colder than the surrounding surface of the sun. They contain lots of iron and many other low- and non-volatile atoms such as metals and rocky material. Very probably, reasonable amounts of sunspot matter have been blown out during this huge eruption.

Element (wt%)	Atomic Mass	Mercury	Venus	Earth	Mars
Fe	26	*64,47*	*31,17*	*32,07*	*9,50*
O (bound)	8	*14,44*	*30,90*	*30,12*	*45,00*
Si	14	*7,05*	*15,82*	*15,12*	*25,00*
Mg	12	*6,50*	*14,54*	*13,90*	*17,00*
S	16	*0,24*	*1,62*	*2,92*	
Ni	28	*3,66*	*1,77*	*1,82*	
Ca	20	*1,18*	*1,61*	*1,54*	*1,50*
Al	13	*1,08*	*1,48*	*1,41*	
Total (wt%)		*98,62*	*98,91*	*98,90*	*98,00*
Total mass (10^{24}kg)		*0,33*	*4,87*	*5,97*	*0,642*

table 2.2 a.[11] [12]

Element (wt%)	Atomic Mass	Jupiter	Saturn	Uranus	Neptune	Pluto
H	1	*90,00*	*93,00*	*59,00*	*74,00*	
He	2	*10,00*	*3,00*	*10,00*	*22,00*	
Rocky core	(estimate) 25		*3,00*	*30,00*	*3,00*	*70,00*
Water	10					*30,00*
Total (wt%)		*100,00*	*99,00*	*99,00*	*99,00*	*100,00*
Total mass (10^{24}kg)		*1899*	*568*	*86,8*	*102*	*0,0125*

table 2.2 b.[13]

The sunspot at point *a* blew out rocky material such as we find in Uranus, Pluto, Neptune and Jupiter.
Very probably, point *c* has ejected some sunspot content which contained much iron, such as we find decreasingly in Mercury, Venus, the Earth and Mars. Did it happen following to an implosion of incoming matter coming from *a*? Though, it seems clear that the group of planets Mercury, Venus, the Earth and Mars are very unlike the group Jupiter, Saturn, Uranus, Neptune, although the group Earth, Mars, Saturn, and Neptune has an almost identical tilt. This confirms a different origin of both groups, but a common eruption event.
Did the two flows join, resulting in a turbulent non-rotating zone near Venus ? I suppose they did. That would help explaining the Mercury's and Venus' tilt and rotation period, and the more "normal" tilt and rotation period of the Earth and Mars. The implosion model in point *a* also helps explaining the properties jump between Mars and Jupiter, while maintaining the Titius law.
The model also explains why Neptune's composition is more Saturn-like than Uranus-like. The normal order of the planets' matter content requires again an inversion of Uranus and Neptune.
The case of Pluto will be discussed later, because of its particularly strange properties and its insignificant size.

Finally, the model is supported by the many spin-orbit and orbit-orbit resonances in our planetary system. These resonances suggest indeed a link between the corresponding objects[15]. The large moons got a 1:1 spin-orbit resonance, indicating that they came out the proto-planets in formation, due to some gravitational eccentricity in the cloud which was in splitting process. Pluto and Neptune have a 3:2 spin-orbit resonances, confirming our model concerning the link between both planets.

3. The temperature and the initial velocity of the huge solar eruption.

Forces acting on the cloud – Gas law, gravitation and kinematics

Immediately after the eruption, the cloud took in a zone, nearby the sun. We consider the cloud in the equator plane for the moment, although the ejection probably occurred at another latitude. Fig. 3.1 shows a very general situation.

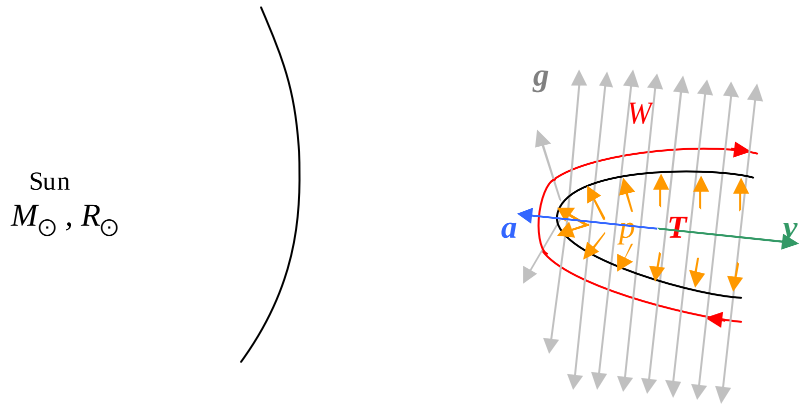

fig. 3.1 : initial eruption cloud.

The influences on the cloud are:

a. The initial velocity v_0, which must have been above the escape velocity of the cloud.
   Hence, $v_0 > (GM_\odot/R_\odot)^{-1/2}$.

b. The pressure p of the gasses and the vapour, which is responsible for the further expansion of the cloud, in all directions. As a matter of fact, the initial velocity is generated by this internal pressure.

c. Thirdly, we have got the temperature, which is related to the pressure as well.

d. The electromagnetic force from the sun, as seen in chapter 2.

e. The gravitomagnetism force, due to the sun's attraction and rotation.

f. Finally, the ejected mass, which is causing a gravitational contraction.

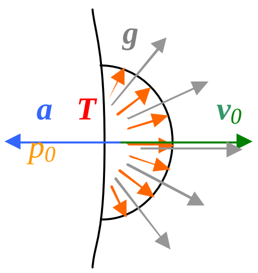

fig. 3.2 : eruption.

The explosion area is shown in fig. 3.2.

The equation of the kinetic and the thermodynamic energies results in [14]:

$$\tfrac{1}{2}\ m_a \langle v^2 \rangle = \tfrac{3}{2}\, k\, T \qquad (3.1)$$

This equation is valid for the average velocity $\langle v \rangle$ and the mass m_a of one gas atom or molecule.
T is the temperature of the eruption which is close to the one of the sun.
k is a physical constant. The sun's temperature is known, and the total expulsed mass can be estimated.

For one mole of gas, equation (3.1) becomes $\tfrac{1}{2}\ m_m \langle v^2 \rangle = \tfrac{3}{2}\, N_A\, k\, T$ where

N_A = Avogadro's number $= 6\ .\ 10^{23}\ mole^{-1}$. This is the number of gas atoms in one mole.

So, $\langle v^2 \rangle = 3\ N_A\ k\ T/\ m_m$

And the gasses' velocity is $\langle v \rangle = (3\ N_A\ k\ T_\odot/\ m_m)^{-1/2}$. (3.2)

k = Boltzmann constant $= 1{,}38\ x\ 10^{-23}\ J/K$

G = universal gravitation constant $= 6{,}67\ x\ 10^{-11} N\ m^2\ kg^{-2}$

$M_\odot = 2\ .\ 10^{30}\ kg$: is the sun's mass.

$R_\odot = 0{,}7\ .\ 10^9\ m$: is the sun's radius.

$T_\odot$ is the sun's temperature at the location of the eruption. It is clear that the eruption of a planetary system must be a very exceptional event. The core, with a radius of $^1/_4\ R_\odot$ has a generally accepted temperature of $1{,}5\ .\ 10^7 K$. Also the corona, outside the sun's surface has about the same temperature. As a first approximation of the exceptional eruption temperature we shall assume that it reached $1{,}5\ .10^7 K$.

m_m equals the mass of one mole of gas particles, which can be hydrogen isotopes, deuterium and helium. Therefore we check the composition of our planetary system in tab. 2.2 a. and b.

Only the four large outer planets have got much hydrogen (91%) and helium (9%). When the eruption took place, the hydrogen was ionised before becoming bi-atomic molecules.

Hence, the average mass m_m is $0{,}91\ g + 4\ .\ 0{,}09\ g = 1{,}27\ g/mole.$

The average velocity $\langle v_h \rangle$ at which the gas particles move inside a gas bubble of the sun can be found out of equation (2.2) :

$$\langle v_h \rangle = 5{,}4\ .\ 10^5\ m/s\ ,$$

and the directions at which these hydrogen gas molecules move are random, because of the many collisions in the gas. A freed molecule however reaches such speeds.

Indeed, the gravitational velocity $v_g = -\ (GM_\odot/R_\odot)^{-1/2}$ will counteract this speed, in order to get a maximum possible initial velocity of :

$$v_0 = (3\ N_A\ k\ T_\odot/\ m_m)^{-1/2} - (GM_\odot/R_\odot)^{-1/2} = 1{,}07.\ 10^5\ m/s \qquad (3.3)$$

out of the sun's surface.

Does this fits the creation of our planetary system ? – A sunspot erupted with the hot cloud

A pregnant question is to know how big the gas bubble should have been in order to eject a mass as large as the sum of all our planets, asteroids, and gasses of our planetary system.

To answer that question, we need to consider that the surface temperature of the sun is only $T_{s\odot} = 5{,}8\ .\ 10^3 K$. If an eruption took place, colder surface matter will be ejected by hot gasses laying below that surface. And as we know from tab. 2.2. , the inner planets contain lots of heavier metals such as iron, just as probably sunspots do. And sunspots are definitely considered as predictors of solar activity.

Thus, we should consider an enormous internal gas bubble blowing away a sunspot out of the sun's gravitation area. We can estimate the sunspot mass m_{sp} as the sum of the inner planets and the cores of the outer planets, which equals $1,2.10^{25}\ kg$; the gas bubble is then the mass of hydrogen and helium m_h in our planetary system, which is $2,6.10^{27}\ kg$ and constitutes only 0,5 % of the total mass of the planets.

This means that the order of magnitude of the final eruption speed v_0 will nearly be $10^5\ m/s$ (order of magnitude). Indeed, we have no confirmation of the real eruption temperature. It is however obvious that if we set $T_\odot < 10^7 K$ in (3.3), the final eruption velocity will tend to zero.

In literature about nuclear fusion, a temperature of $10^8 K$ is mentioned to make carbon by fusion of helium. Even hotter temperatures are needed to make possible the fusion of other nuclei and to finally produce iron, which is the final step in the fusion process, as the atomic number equal to 26 makes a peak of the binding energy curve. Higher fusion steps would consume instead of create energy.
The chosen temperature $T_\odot = 1,5\ .10^7 K$ is in that way not overestimated.

What we have found out until now is:

A solar eruption left the sun's surface at an initial speed of nearly $10^5\ m/s$, assuming an initial cloud temperature of $1,5\ .10^7 K$. In any case, the minimum temperature must have been of order $10^7 K$.
During the eruption, huge masses of hydrogen and helium ions snatched other colder matter of a sunspot, which was then expelled as well.

In the next chapter we are analysing how the planets split-off from the cloud.

4. How the first planets got separated.

We shall understand in the present chapter, but also the following ones, that the logical separation order of the planets is the formation of the inner and the outer planets at first. There are three physical phenomena which are responsible for the separation of the planets off the cloud.

The orbit drift. – Tangential velocity defines the orbit

We have seen in chapter 2 that the sun's magnetic field will cause a prograde or retrograde swing (I guess it was prograde) of the ionised part of the cloud. The same force transformed a part of the radial velocity into a tangential force. The cloud has been driven towards the sun's magnetic equator by the same force.
In my work "*A coherent double vector field theory for gravitation*" [1] of 2003 we saw that the gyrotation forces of the sun cause a swing as well, although much weaker, and bring the cloud in the equatorial area too.

The cloud is widely spread, as shown in fig. 2.3 and 2.4, and its fractions cover a wide range of orbit velocities.
Each movement will have consequences on the law of energy conservation between gravitation and centrifugal forces, which is, for small speeds, expressed by:

$$v^2 = GM / r \qquad (4.1)$$

All these effects make the cloud becoming spirally shaped. This effect alone will however not split-off the planets.

The axial tilt. – Repellent turbulences help separation

Earlier we saw that the fractions of the cloud near points a and c are dissimilar because of their tilt. These different tilts cause a turbulent region between in the cloud's fractions, where many collisions occur. Due to the high temperature of the gasses, the turbulent zones are more repellent, what makes the split-off easier.

In our opinion, neither this effect seems sufficient to obtain the split-off. But third force was added to the other two.

The gyrotation pressure. – Edges separated faster

In my work *"Cassini-Huygens Mission, New evidence for the Dual Field Theory for Gravitation"*[4] I have shown that the tiny Saturn rings did split-off one by one from a larger ring, because of the gyrotation force which is caused by the orbit velocity of the rings.
Very rapidly, the ring's edge laying the most inwards near Saturn separates, forming so a tiny ring. As well the most outer laying edge of the same main ring detaches. One by one, the separations will result in new edges for the main ring. And again the extreme edges will form new tiny rings. Bit by bit, the main ring will be transformed into tiny rings, from the outer edges towards the centre of the main ring.

In our planetary system, the split-off happened analogically: first were separated Mercury and Neptune, shortly later Uranus. We believe this because (4.1) is responsible for a slower proto-Neptune, so that point a, thus proto-Uranus approached the remaining cloud, while proto-Neptune got away from it.
These separations reduced the extent of the remaining cloud. But what about Pluto?

The separation of Mercury, Pluto, Uranus and Neptune. – First steps in defining the separation order

Can we assume that Mercury and Pluto must have separate from the cloud when the rest of the cloud still remained intact? As a matter of fact, how certain are we that Pluto is no adopted planet? We can answer the latter question. The level of certitude follows of the density of the planet. This is virtually the same as the one of Neptune, the last planet but one. In tab.2.1 some important parameters of all planets are reproduced, showing this.

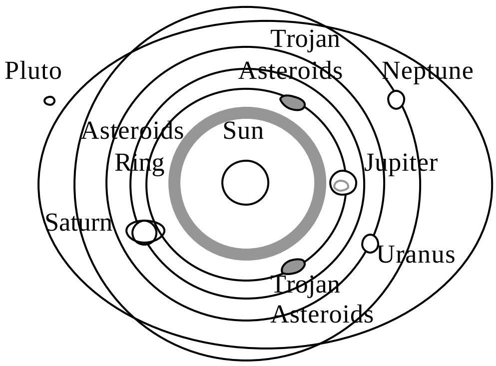

fig.5.5 : orbits of our planetary system.

Nevertheless still the next uncertainty exists. Is Pluto the first separated planet on that side? The mass of Pluto is only one fraction of that of Neptune. Moreover all planets beyond Mars are large, with a low density, what shows that the cloud at that place indeed experienced a small gravitation and gyrotation force.
The separation of Neptune of the cloud as the first planets at that side, before Pluto, is however much more logical. The extremity of the cloud was very extended by the gasses, what justifies the separation of a large planet. It seems more obvious that Pluto arose only accidentally, in the neighbourhood of Neptune and Uranus, because there could have been a small limb between Neptune or Uranus and the rest of the cloud. The axial tilt of Pluto, its composition and its rotation period, which has a 3 to 2 orbit resonance with Neptune, even suggests that Pluto arouse out of the region near proto-Neptune.

Pluto has a nearly symmetric elliptic orbit with the circular orbit of Neptune, and both orbits join twice per revolution, in the neighbourhood of the small axis of Pluto's ellipse. In the next chapter we will try to find the reason for it more in detail.

Let us safeguard this conclusion for the time being. Out of tab. 2.1. follows also that the size, the spread-out of the orbits, the densities and the tilts correspond quite well with our model of fig. 2.3, corrected with fig. 2.6.

5. The reason of the elliptic orbit of Mercury and Pluto.

The gravitation force of the cloud – Mercury and Pluto got a gravitational oscillation

Earlier, we saw that the split off of Mercury and Neptune apparently took place at first, probably together with Pluto, and next Uranus, whereas the rest of the cloud remained still a whole, even if it was a widely extended spiral cloud.

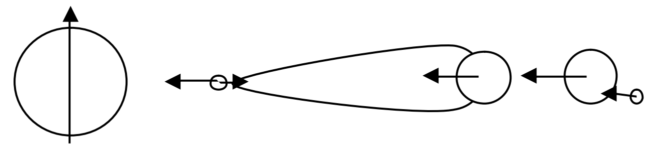

fig.5.1.a : gravitational planet's sepatation model : separation of ME, UR, NE, PL.

In fig.5.1.a the solar system is presented after the formation of the first four planets.

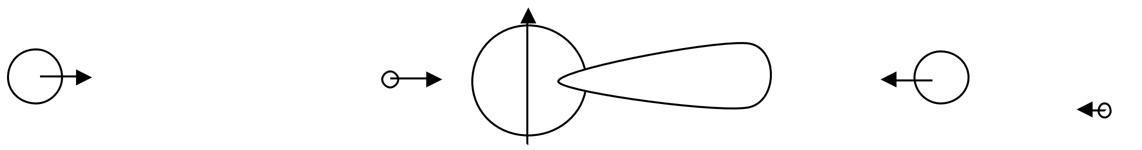

fig.5.1.b : gravitational planet's sepatation model : other view.

Naturally, it follows from the law (4.1) that those planets which no longer revolute in phase with the cloud, will finally reach their dedicated orbit.

In fig.5.1.b we have drawn the cloud in front of the sun, under a certain angle.
Based on this figure, we find that the gravitation forces that are experienced by Pluto, Uranus, and Mercury became quite different: Pluto experiences a smaller force because the other planets are now further away. Mercury now experiences a larger force because the cloud stands farther away. Both planets have got an eccentric revolution orbit because there original gravitation forces vanished as soon as the split off changed their orbit frequency. The planets were therefore swung to a higher (for Pluto) or lower orbit (for Mercury), where they obtained respectively a smaller or larger speed. This exchange of potential and kinetic energy becomes an oscillating motion, what means an elliptic orbit. Without doubt, the small mass of both planets were at the origin of such strong effect.

The eccentricity of Neptune's orbit – Neptune was the lonely planet

And Neptune? Its orbit appears to not be eccentric!
Could the spiral shaping of the cloud be the cause of this? Probably it is. Neptune position was influenced by the expanding and the spirally spreading-out of the cloud, presented as fig.5.2 (upper sight). The gravitation force of

the cloud did not change the circular orbit, because due to (4.1), Neptune slowed down and went tangentially away from the cloud, whereas Uranus could stay closer to the remaining cloud. It is not impossible that Pluto was also swung away by Neptune's gravitation effect, what enlarged the main axis of the elliptic orbit.

The other planets have also got characteristics which follow from this model. In the next chapter we see which ones and how this happened.

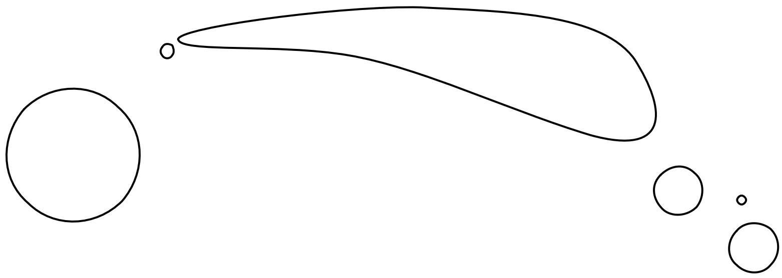

fig.5.2 : gravitational planet's sepatation model : top view.

6. The shaping of the other planets and objects.

Venus, the Earth, and Mars on the one hand, Neptune, Uranus, and Saturn on the other hand.

In the same way as the first planets have split themselves off, also Venus, the Earth and Mars successively split off. The cloud became each time less extended, but at the same time the spiral shape of the cloud became larger. It seems perhaps strange that Mars is a lot smaller than the Earth and Venus. But on the other hand, it is not at all certain that the cloud was nicely homogeneous. It is indeed conceivable that it consisted of parts with different composition, with regard to the shape and with regard to the type of particles: the totally different properties of gasses and solid particles grouped the solids closer to the sun, and the gasses further away.

The same was valid for Uranus and Saturn, which also successively split them off. Two planets which are much larger, revolve on much larger distance, and have got a low density, as expected.

The residual planet, Jupiter, and the remaining objects such as the Asteroids Belt and the Trojan Asteroids have not yet been discussed. They form a separate part of our solar system, they confirm our model once again, and allow us still to improve the description of the solar eruption cloud.

Jupiter, the Asteroids Belt and the Trojan Asteroids. The shaping and the elliptic orbit of Mars.

Jupiter has been created totally unlike the other planets. This planet is the last one which arose, the largest, and stood in the middle of the system. It is also the one that today resembles the most the original cloud. This planet has been separated from nothing else, and has remained what it was at the origin: a cloud of gasses.
A remarkable similitude between the model and the planets' data, which we analysed also in chapter 2, lays in the fact that Jupiter has a global magnetic field of 0,1 Tesla (10^3 Gauss), as much as the magnetic field of a sunspot. This suggests that Jupiter is magnetically similar to the sunspot area of which it has erupted.

But not only Jupiter however did remain at last. On the same orbit as Jupiter and on equal distance of it we have a group of Asteroids. They are respectively called the Western and the Eastern Trojan Asteroids, and are situated at 60° to the right and the left of Jupiter, in the so-called Lagrange points.

And between Mars and Jupiter is situated the widely spread Asteroids Belt.

The reader will already have realized that this Asteroids Belt arose from the spiral cloud, after that all planets were formed, and when the spacing of the residual parts of the cloud had no chance any more to get regrouped, because the residual spiral cloud finally became an eccentric ring. The reason for the somewhat more elliptic shape of Mars' orbit has to do with the eccentric spiral shape which the "Asteroids cloud" then already had (when forming an almost closed ring) strongly influenced by the attraction force of Jupiter. This deformed Mars' orbit the elliptic way as well, the more by its quite small mass. Jupiter keeps this eccentricity of the Asteroids Belt ongoing. Mars is smaller than the Earth, against all expectations. This can only be explained by the spread-out of the proto-Asteroids Cloud before Mars' final formation, resulting in a much smaller cross-section of the cloud at Mars' orbit level.

The Trojan Asteroids are something strange. But also there, we can assume that the cloud, close the eventual orbit of Jupiter was already spirally stretched, so that the astringency of that portion of the spiral could not entirely take place: the centre part of that circular section of the cloud contracted towards Jupiter, but on both sides in the same orbit the gravitation forces did not reach sufficiently far and so there stay behind two groups of Asteroids, symmetrically positioned relative to Jupiter.

Finally, the thoughts above about Jupiter bring us to a solution for Jupiter's tilt. The spiral cloud where Jupiter and the Trojan Asteroids were made measured at least a third of the orbit circumference. But as well, that part of the cloud filled several orbit widths, with their own velocities and orbit periods. The tilt is about 26°, but the several fractions of this cloud got different orientations of this same tilt after many orbital periods. It is perfectly possible that the grouping of those different orientations of this tilt resulted in the average tilt of 3°.

7. Additional validation of the model

The rotation period of Jupiter – The rotation period fits the model

Jupiter, the largest planet and which resembles the most the original erupted cloud can be used for some control calculations, at least, to verify the validity of the order of magnitude of the model. This should define the final credibility of the model as a whole.

The eruption took place under a magnetic field. This made the hydrogen ions rotate screw wise at a certain speed, probably the same velocity as Jupiter's rotation velocity.

The rotation velocity of Jupiter is 9,9 hours.
Using table 2.2, the equatorial velocity at Jupiter's surface is :

$$v = p\ 1{,}4.10^{8}\ m / (9{,}9\ .\ 3600\ s) = 1{,}26.\ 10^{5}\ m/s$$

The overall average velocity has the order of magnitude of $10^{5}\ m/s$.

This velocity complies with the assumed eruption velocity of (3.3) of about $10^{5}\ m/s$.

The orbit velocity of Mercury – The orbit velocity does not fit the model

This initial velocity and the existence of the initial spirally screwing cloud suggest that we can split the velocity into two components: $(1/2)^{1/2}$ of the velocity was rotating tangentially and $(1/2)^{1/2}$ of the velocity was a speed along the guiding magnetic field line.
We also know that the radial speed became an orbit speed and that the tangential component has got a strong induced magnetic speed reduction. The same flow velocity caused the implosion in point a that was followed by the mass ejection in a. The orbit speed of Mercury would end up at about $0{,}88.10^{5}\ m/s$ when using our model, due to energy losses during the implosion. Mercury's orbit velocity is now about $5.10^{5}\ m/s$. This value is much larger than what we would expect. Other possible phenomena should be considered for the core planets.

The speed along the guiding magnetic field line cannot be used to verify the compliance of the model with other planets, because the line orientation in space can not be determined.

8. Conclusion: the formation of our planetary system.

The assumption of a huge solar protuberance, adopted at the beginning of this work appears to give, by using classic physics and the Maxwell analogy for Gravitation, the complete description for the creation of our planetary system, and the eccentric orbit of Mercury, Mars and Pluto.
The planets were created from one eruption, but consisted of two successive eruptions: a first eruption of mainly hydrogen at one side of the protuberance (proto-Uranus (!), -Neptune, -Saturn, -Jupiter), followed by an eruption due to the shock wave at the other side of the protuberance (proto-Mercury, -Venus, -Earth, -Mars).
One by one, the planets have been separated from the cloud rather quickly, starting with the outer planets Neptune and probably Pluto, followed by Uranus, Saturn and Jupiter with the Trojan Asteroids on the one hand. The planets Uranus and Neptune got inverted during their formation. Pluto arose probably from a small limb out of Neptune.
On the other hand we had first Mercury, followed by Venus, the Earth, Mars –together with the proto-Asteroids cloud– , and the Asteroids Ring. The Asteroids remained at last as coagulated scraps in the spiral, and in the end a central Asteroids Ring.
Many parameters have been checked with the model. The planets' axial tilts comply with the model, including these of Uranus and Venus. Their composition, size, mass, orbit, and rotation period comply as well. The orbit velocity of Mercury complies moderately. We did not find any significant parameter contradicting the model.

9. References and interesting lecture.

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the general science journal

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Curiosum : The Titius-Bode law shows a modified proto- gas-planets' sequence.

by using the Solar Protuberance Hypothesis and Gravitomagnetism.

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Summary

During my research on a better comprehension of the formation of our planetary system, which started with my paper "*Are Venus' and Uranus' Tilt of Natural Origin?*", it appeared to me that the protuberance-model needs an addition. As know from my former paper, Neptune is the "lonely planet". But I found more.

In this paper, I come to the *curiosum*, that the sequence order of the gas-planets, at the very beginning of its existence as proto-planets, should have been as follows: proto-Jupiter, -Neptune (!) , -Saturn, and -Uranus.

The basis for this research lays in the existence of the remarkable Titius-Bode law, and the unexpected successive matter composition of our gas-planets.

Index

1. The solar protuberance.

The Titius-Bode law – The orbits of the planets are spread according a simple law.

In the paper "*Are Venus' and Uranus' Tilt of Natural Origin?*", it appeared that the planets were probably born out of the sun due to a huge protuberance. A part of it, containing screwing gasses, has been following an electromagnetic force line coming out of the sun, and was mainly composed of hydrogen and helium, supposed to be electrically charged (ions). Thus, a spirally wound ring-segment arose from the sun, was then fractioned into proto-planets and finally became a set of planets.

One of the reasons to suppose the existence of a protuberance instead of a interstellar cloud (like another theory proposes) is the fact that there exists only one planet per orbit, and that these orbits lie on certain distances of each other, as follows from the empiric Titius' law (also known as Titius-Bode law): $a = 0{,}4 + 0{,}3 \cdot 2^n$, wherein a is the semi major axis in (AU) and the exponent n, takes the values 1, 2, 3, ... This law was found in 1766, when Uranus was not discovered yet. Nevertheless, it is also valid for the distances of Uranus and Neptune to the sun.

The gas-part and the core-part – Basic concept

As explained in my former paper, the protuberance was a solar eruption in which all types of the planet's atoms were already present. It caused the ejection of matter, about 0,15 % of the sun's total mass, at a speed of about 10^5 m/s .

The hypothesis of a solar protuberance implies that the planets were created from one eruption only, but consisted of two (successive or simultaneous) eruption shocks: a first eruption shock of mainly hydrogen and some helium at one side of the protuberance (proto-Uranus, -Neptune, -Saturn, -Jupiter), followed by an implosion-explosion shock due to the hydrogen shock wave hitting a solar spot at the other side of the electromagnetic force line of that protuberance (proto-Mercury, -Venus, -Earth, -Mars).

2. The initial expansion speed of the proto-gas-planets.

The electromagnetic properties of a solar protuberance – A screwing hot cloud

When the protuberance or eruption is formed, and taking in account the second shock, hitting the solar spot, the series of proto-planets has the following shape. When mass ejections occur, at very high temperature, the ionised hydrogen and the electrons follow a magnetic path which quit one sunspot pole and go to the other pole, creating so a magnetic buckle outside the sun's surface (fig.2.1).

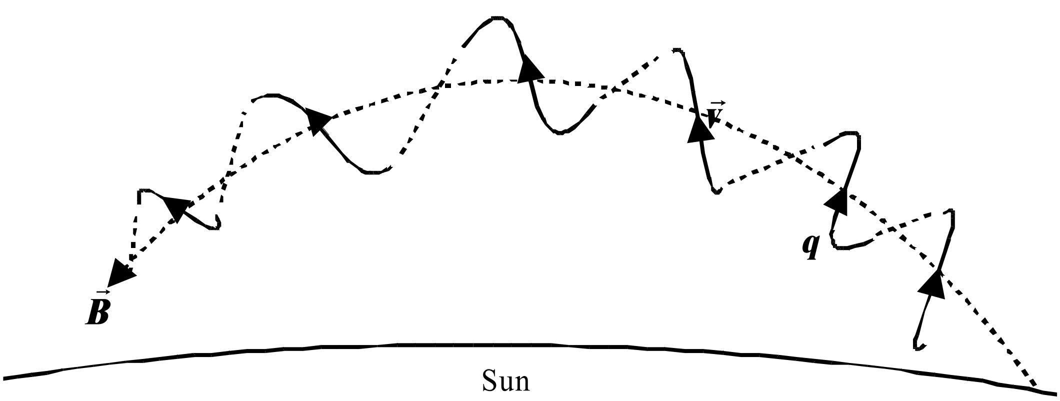

Fig.2.1

In fig.2.1 , ***B*** is the magnetic field, ***q*** the electric charge and ***v*** the screwing speed of the hot cloud. Remark that the dynamics of the cloud are essentially defined by the positive hydrogen ions. The mass of electrons is too insignificant to influence these dynamics. The electrons will screw very tightly about the electromagnetic force line, in the inverted screwing direction of the hydrogen- and helium ions.

The rotation speed of the proto-gas-planets has been found in former paper out of some thermodynamic considerations of the sun, and this speed complies perfectly with the actual rotation speed of Jupiter.

Disruption into proto-planets – *Basic equations*

How did the protuberance exactly split-up into proto-planets? Therefore we have to look at fig.2.2.

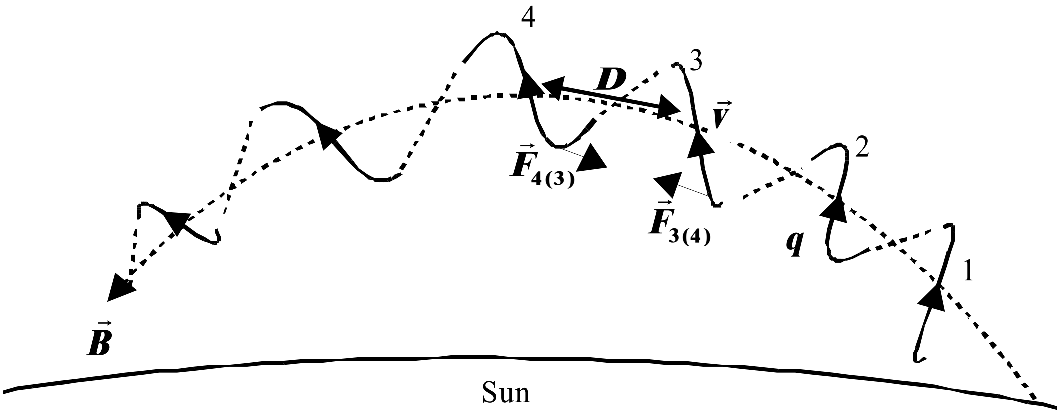

Fig.2.2

Since there are four gas planets known, I will restrict the number of parts to four, assuming that the other parts are insignificant for next calculation. The solid planets are much smaller than the gas-planets and their electromagnetic charge is not easy to estimate. Was a ionised cloud surrounding them? According to which distribution? Therefore, I will not consider too much the solid-core planets further for this paper.
Each part of the screwing hot cloud will undergo a force from the other parts. So, it follows that the cloud will expand in length, allowing the final separation of the parts into proto-planets. The distance D between the parts is assumed to be the same for the whole protuberance.
In the drawing, I have shown two examples of forces: $F_{4(3)}$ and $F_{3(4)}$ which mean respectively the force on part 4 due to part 3, and the force on part 3 by the part 4.
For simplicity, I consider the X-axis positive to the right side, and I disregard the bending of the magnetic force line. This is allowed because, at the end, all the planets move in elliptic orbits, and the starting direction of the proto-planets at this stage of the study is then of little importance.

The forces can then be written as follows.

For part 1 (the first proto-gas-planet):

$$\boldsymbol{F}_{1(2)} = \frac{\boldsymbol{q}_1 \boldsymbol{q}_2}{4\pi\,\varepsilon_0 \boldsymbol{D}^2} \qquad \boldsymbol{F}_{1(3)} = \frac{\boldsymbol{q}_1 \boldsymbol{q}_3}{4\pi\,\varepsilon_0 (2\boldsymbol{D})^2} \qquad \boldsymbol{F}_{1(4)} = \frac{\boldsymbol{q}_1 \boldsymbol{q}_4}{4\pi\,\varepsilon_0 (3\boldsymbol{D})^2}$$

Hence :

$$\boldsymbol{F}_1 = \sum_{i=2}^{4} \boldsymbol{F}_{1(i)} = \frac{\boldsymbol{q}_1\,(36\boldsymbol{q}_2 + 9\boldsymbol{q}_3 + 4\boldsymbol{q}_4)}{144\,\pi\,\varepsilon_0\,\boldsymbol{D}^2} \qquad (2.1)$$

and the acceleration a_1 of the part 1 with mass m_1 is : $$a_1 = \frac{F_1}{m_1} \tag{2.2}$$

For the acceleration of the other parts of course, a similar equation as (2.2) exists.

For part 2 :

$$F_{2(1)} = \frac{-q_2\, q_1}{4\pi\,\varepsilon_0\, D^2} \qquad F_{2(3)} = \frac{q_2\, q_3}{4\pi\,\varepsilon_0\, D^2} \qquad F_{2(4)} = \frac{q_2\, q_4}{4\pi\,\varepsilon_0 (2D)^2}$$

Hence :

$$F_2 = \sum_{i=1,3,4} F_{2(i)} = \frac{q_2(-4q_1 + 4q_3 + q_4)}{16\pi\,\varepsilon_0 D^2} \tag{2.3}$$

For part 3 :

$$F_{3(1)} = \frac{-q_3\, q_1}{4\pi\,\varepsilon_0 (2D)^2} \qquad F_{3(2)} = \frac{-q_3\, q_2}{4\pi\,\varepsilon_0\, D^2} \qquad F_{3(4)} = \frac{q_3\, q_4}{4\pi\,\varepsilon_0\, D^2}$$

Hence :

$$F_3 = \sum_{i=1,2,4} F_{3(i)} = \frac{q_3(-q_1 - 4q_2 + 4q_4)}{16\pi\,\varepsilon_0 D^2} \tag{2.4}$$

For part 4 :

$$F_{4(1)} = \frac{-q_4\, q_1}{4\pi\,\varepsilon_0 (3D)^2} \qquad F_{4(2)} = \frac{-q_4\, q_2}{4\pi\,\varepsilon_0 (2D)^2} \qquad F_{4(3)} = \frac{-q_4\, q_3}{4\pi\,\varepsilon_0\, D^2}$$

Hence :

$$F_4 = \sum_{i=1}^{3} F_{4(i)} = \frac{-q_4\,(4q_1 + 9q_2 + 36q_3)}{144\,\pi\,\varepsilon_0\, D^2} \tag{2.5}$$

The order of the proto-planets however is not known, and we have to find this out by reasoning or by trying out all the possibilities.

3. Evaluating the gas planets' order.

The gas planets' order, based on the actual physical data – The sequence order changed.

There are several reasons to doubt that the actual order of the planets is the same as that of the conception of the proto-planets. In my former paper, I found a few ones. One of the conclusions was that Neptune, the 'lonely planet', was perhaps inversed with Uranus due to the shape of the protuberance. This inversion fit quite well with the strange tilt of Uranus.

Here, I will find another point of view. But amazingly, it is not exactly what I expected. Neptune originated from a totally different region of the protuberance! Although the formal evidence is missing, interesting indications will be found here.

With (2.2), the acceleration of the parts of the protuberance can be calculated, taking in account the electrical charges, which are directly proportional with the known planetary masses.

		SUN	MERCURY	VENUS	EARTH	MARS	JUPITER	SATURN	URANUS	NEPTUNE	PLUTO
Mass	(10^{24}kg)	*1989000*	*0,33*	*4,87*	*5,97*	*0,642*	*1899*	*568*	*86,8*	*102*	*0,0125*
Diameter	(10^3 m)	*1390000*	*4879*	*12104*	*12756*	*6794*	*142984*	*120536*	*51118*	*49528*	*2390*
Density	(kg/m^3)		*5427*	*5243*	*5515*	*3933*	*1326*	*687*	*1270*	*1638*	*1750*
Rotation Period	(hours)		*1407,6*	*-5832,5*	*23,9*	*24,6*	*9,9*	*10,7*	*-17,2*	*16,1*	*-153,3*
Distance from Sun	(10^9 m)		*57,9*	*108,2*	*149,6*	*227,9*	*778,6*	*1433,5*	*2872,5*	*4495,1*	*5870*
Orbital Period	(days)		*88*	*224,7*	*365,2*	*687*	*4331*	*10747*	*30589*	*59800*	*90588*
Orbital Inclination	(degrees)		*7*	*3,4*	*0*	*1,9*	*1,3*	*2,5*	*0,8*	*1,8*	*17,2*
Orbital Eccentricity	Eccentricity		*0,205*	*0,007*	*0,017*	*0,094*	*0,049*	*0,057*	*0,046*	*0,011*	*0,244*
Axial Tilt	(degrees)		*0,01*	*177,4*	*23,5*	*25,2*	*3,1*	*26,7*	*97,8*	*28,3*	*122,5*

table 3.1[16]

In table 3.1 , the strange axial tilt of Uranus and its unexpected negative rotation period brought me, in the former paper, to the investigation of the protuberance's shape. Neptune did not play any significant role in this investigation.

As shown in the table 3.2, Uranus has a remarkable matter composition, compared with the other gas planets.

Element (wt%)	Atomic Mass	Jupiter	Saturn	Uranus	Neptune	Pluto
H	1	*90,00*	*93,00*	*59,00*	*74,00*	
He	2	*10,00*	*3,00*	*10,00*	*22,00*	
Rocky core	(estimate) 25		*3,00*	*30,00*	*3,00*	*70,00*
Water	10					*30,00*
Total (wt%)		*100,00*	*99,00*	*99,00*	*99,00*	*100,00*
Total mass (10^{24}kg)		*1899*	*568*	*86,8*	*102*	*0,0125*

table 3.2 [13]

Thus, the order-sequence of the gas-planets' orbits, compared which the sequence of their tilts and their composition, did me think of some inversion between the planets, compared with the original combination of proto-planets.

Is the switching of Uranus and Neptune confirmed here ? – The wrong hypothesis

My former paper, "*Are Venus' and Uranus' Tilt of Natural Origin?*", suggests that Uranus' and Neptune's orbit became inverted during their conception, due to the supposed high curvature of the protuberance's ends. Since Uranus is very different of the other gas-planets, the inversion hypothesis seemed to be the logical solution.

	Proto planets	**M [kg] (xE24)**	**q [C] . k**	**a [m/s²] . p**
1	**Jupiter**	1899	1899	150,79
2	**Saturn**	568	568	-443,83
3	**Neptune**	102	102	-238,99
4	**Uranus**	86,8	86,8	-113,75

Table 3.3 : *The wrong hypothesis.*

In the table 3.3 , the equations (2.1) to (2.5) are applied on the supposition that Uranus' and Neptune's positions in the large sun's protuberance were originally inverted, compared with the orbits of today.

I connect the condition for the direct proportionality of the accelerations with the orbit radii to the following: the physical law (for low velocities)

$$v^2 = GM / r \qquad (3.1)$$

must have been able to catch the planets into orbits, while they decelerated due to the increasing distance to the sun, and thanks to the bending path of the ejected proto-planets, caused by the sun's gravitation.

For the easy use of the calculations, I have put the figures of the electric charges of the proto-planets equal to the actual masses' data of the planets, multiplied with a unknown constant factor *k*. The reasons are firstly that it is probable that the hot cloud was almost totally ionised and secondly that the value of the distances D between the protuberances' parts are not known.

The results for the initial acceleration of the proto-planets' are multiplied with an unknown constant factor *p* as well.

Interpretation of the acceleration's sign – The sign does not matter

Indeed, the sign of the acceleration is of no importance, because the path can initiate an orbit at both sides of the sun. A negative (positive) sign for the acceleration will cause a prograde (retrograde) orbit, -or inversely-.
Even when the orbits initiate in retrograde way, these orbits will turn back into prograde orbits, as explained in *"A coherent dual vector field theory for gravitation"*. This collapse is generated by any body, moving in the spinning gravitation field of the sun, and the conclusion was that the prograde-wise spinning sun will automatically generate prograde orbits of the planets. During this *angular collapse*, the orbit's diameter remains unchanged, and the retrograde orbit turns towards a prograde orbit, more or less about a virtual axis, laying in the sun's equator plane.
Table 3.3 however is not inspiring at all. Since the accelerations are -or should be- directly proportional with the distances of the actual orbits of the planets, the final order-sequence would then have become : Uranus, Jupiter, Neptune, Saturn, which is indeed not correct.

Since the hypothesis of table 3.3 did not work, other alternatives should be tested.

The alternate hypothesis for the initial position of Neptune – The helium content as an indicator

One of the other possible positions of Neptune can be found out of the matter composition of the planets. Neptune got only 3% of rocky matter, just as Saturn. At the other hand, the mass-sequence (gradually from very large mass to small mass) of the actual gas planets sequence is surprising. Maybe we should try to put Neptune near Jupiter, in order to get the more another protuberance sequence: proto-Jupiter, -Neptune, -Saturn, -Uranus. This makes sense regarding their absolute (not relative) helium and rocky core content, which are then successively decreasing (see table 3.1). Proto-Uranus, of which its heavy rocky core is then at an extremity of the protuberance.
The result of that hypothesis is given in table 3.4.

	Proto planets	**M [kg] (xE24)**	**q [C] . k**	**a [m/s²] . p**
1	**Jupiter**	1899	1899	63,41
2	**Neptune**	102	102	-327,33
3	**Saturn**	568	568	-122,49
4	**Uranus**	86,8	86,8	-201,13

Table 3.4 : *The right hypothesis and the best fit.*

Here, when considering only absolute values for the acceleration $\boldsymbol{a}$, we find the final sequence *Jupiter*, *Saturn*, *Uranus*, *Neptune*, because the accelerations are directly proportional with the orbit radii.

In (3.1) , v is the tangential velocity in relation to the sun, and r the radius of the orbit position at any moment, associated to the mass of each part (proto-planet) of the cloud.

A very interesting discovery in table 3.5 is the compliance of the orbit radii with the Titius-Bode law. Although the values do not fit 100% perfectly, the orders of magnitude follow very well the 2^n -law, because each orbit diameter is about half the next orbit diameter. The result for Jupiter is less significant than the Titius-Bode law requests it, but the other results are very impressive. Remark that the constant value in the Titius-Bode law is insignificant for the larger orbits of the gas-planets.

	Original sequence		Final sequence
1	Jupiter	1	Jupiter
2	Neptune	2	Saturn
3	Saturn	3	Uranus
4	Uranus	4	Neptune

Table 3.5

An huge initial acceleration (five times the acceleration of Jupiter !) must have pushed Neptune away at a very high speed. Since the distances D between the successive parts of the screwing protuberance are not known, I am unfortunately unable to define the real initial accelerations.

4. Discussion: Is all the preceding to be taken seriously?

Apparently, the point of view in *"Are Venus' and Uranus' Tilt of Natural Origin?"*, where an inversion of Uranus and Neptune has been suggested, contradicts the actual analysis. But even if it does, this will not affect the general thoughts and the conclusions of that former paper, because mainly the tilt of the planets was concerned in there, and the considerations about Neptune took no preponderant place.

All other combinations for the correspondence of the electro- and gravitodynamics of the protuberance with the Titius-Bode law came out to nothing.

The excellent compliance of the sequence *proto-Jupiter, -Neptune*, *-Saturn*, *-Uranus* with the Titius law makes possible to go further on this exciting research.

But is the compliance of these calculations with the Titius-Bode law not merely accidental? Must this study be taken seriously? I really don't know. Maybe, maybe not.
The only thing we can do about it is to find other indications stating or refuting the switching of the (proto-)Neptune's sequence, and to look at the possibilities of an accidental fitting of the figures.

At the first sight, there are some difficulties, such as the less perfect compliance of the Jupiter's orbit. At the other hand, the calculations are made with pure and simple maths, based on the well-known Coulomb force.
The protuberances of the sun, which are regularly observed, vanish indeed after some strange and sudden smear-outs in different directions.
The interpretation of the signs with the Maxwell Analogy for Gravitation is based on well-known properties, which are implicitly validated by the quasi-equivalence between this analogy and the GRT.

By testing all other combinations of order sequences for the proto-gas-planets, none of these sequence orders fits (even very approximately) the Titius-Bode law.

Probably, the actual hypothesis should be taken seriously enough to allow further research on questions such as: What is the reason for Jupiter's less perfect fitting? How about the other, smaller planets: is the present theory applicable as well and did there exist a different sequence order at the conception than the actual one? Do the existence of the asteroid ring comply with the protuberance model of this paper? What was the sequence-order of the eight proto-planets? Etc.

5. Conclusion : curiosum about the formation of the gas-planets of our planetary system.

The hypothesis of the changed gas-planets' sequence, essentially of Neptune, allows maintaining the assumption of a huge solar protuberance, while fitting the Titius-Bode law quite well. The planets were created from one huge eruption, but consisted probably of two successive (or simultaneous) eruption shocks: a first eruption shock of mainly hydrogen at one side of the protuberance : proto-Uranus, -Saturn, -Neptune (!) , -Jupiter (or the other way around), followed by an implosion-explosion shock due to the first shock wave at the other side of the protuberance : proto-Mercury, -Venus, -Earth, -Mars, in a yet unknown sequence order.
Using this protuberance theory, and calculating the initial electromagnetic accelerations due to the ionisation of this hot screwing cloud, the requested position of proto-Neptune is quite a surprise. The sequence of the proto-gas-planets has been validated using the Titius-Bode law, to which the found orbit sequences fit remarkably well.
For the interpretation of the data, the use of the principles of the Maxwell (or better Heaviside-) Analogy for Gravitation is mandatory, making evident the indifference of the initial orbit direction of the proto-gas-planets.

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2

First validation of the Theory

How can we be sure of the validity of the theory? In the first place, the excellent relative fit of the orbit diameters, speaks for itself. But one could wonder how the almost circular orbits that we observe could form. Does a solar burst guarantees a circular orbit? Not at all.
The first paper proves that whatever the original orbits' eccentricites were, they end up to become almost circular.

Another validation concerns the discovery of gas planets elsewhere in the universe. An interesting test of the theory occurred with the discovery of a huge gas planet in 2007. Several examples have been observed, and in the second paper, we look at such a gas planet.

The next and last paper of this chapter continues to refine the investigation about the Solar Protuberance Theory through the creation of the gas planets. It is very probable that a small part of the initial mass ejection got lost in space. When applying that possibility, one comes to the astonishing result that the Solar Protuberance Theory fits with the final orbital positions of the gas planets for 99,99%!

Hereafter, the reader will find some more supporting papers for the theory.

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Natural Decrease of Orbital Eccentricities

Explained by Gravitomagnetism

Thierry De Mees

Abstract: The amazing Solar Protuberance Theory gives three strong proofs for the creation of our planets from a huge electromagnetic eruption. I found a 99,98% probability fit between the initial planetary orbit diameters calculated with the theory and the actually observed ones. Since the initial orbits probably were highly eccentric, the question remains whether or not the actual planetary orbital eccentricities can be explained by the theory. This is proven here in different ways.

Keywords: Gravitomagnetism, planets, spinning stars, black holes, Solar Protuberance Theory.

1. The Solar Protuberance Theory

All the planets were created out of the sun. In an earlier paper [4], I have proven that the thermal energy of a solar eruption perfectly complies with the kinetic energy of Jupiter, our largest gas planet. In latter papers [5] [6] [7] [8], I proved that a simultaneous electromagnetic eruption occurred of both, the set of the four core planets and the set of the four gas planets. The electromagnetic eruption was made of a plasma spiral of protons that followed a solar magnetic line. The spiral was made of four huge loops. Simultaneously, an spiral of electrons erupted from a sunspot area, and followed the solar magnetic line as well. The spiral was made of four smaller loops. The four loops of each set got repelled by Coulomb repulsion and got ejected in space.

This theory is likely because of two more reasons. The first one is that, amazingly, the quotient of the masses of both the core planets and the gas planets corresponds to the quotient of the electron mass to the proton mass.

Secondly, the calculations of the electromagnetic repulsion of the planets exactly comply (as mutual relative values, up to a 99,98% probability) with the actual orbit sizes for all the planets, as well for the set of core planets as for the set of gas planets. The only missing information is the eccentricity of the orbits, and it is probable that their initial eccentricity was much higher than nowadays. But how could the eccentricity change?

2. The classical orbital energy losses

It is obvious that no work is exerted by orbiting objects. The planets are in a state of equilibrium between potential and kinetic energy and the resulting path generally becomes an fairly perfect ellipse.

But the path can be occupied by dust and cause a counter pressure that depends from the planet's shape, its diameter and its squared velocity. Since the elliptical path causes the planets to have variable speeds, maximal at the perihelion and minimal at the aphelion, the counter pressure by dust will act differently along the elliptic path as follows. When the planet's speed reaches its maximum, the counter pressure slows it down. And a slower planet moves to a wider orbit.

Such a process will make the planet widening its orbit at places where the speeds are high, and at places of lower speed it will almost remain at its orbit.

3. The 'relativistic' orbital energy losses

Another effect is occasioned by the so-called relativistic effect of the planet's speed. In terms of the relativity theory, this means that if one wants to maintain the speed of a fast planet, one has to put the energy into it.

According to the Newtonian case, the elliptical path would remain the same forever. Here however, the high velocity at the planet's perihelion makes the orbit slowing down by the relativistic effect.

In terms of gravitomagnetism (i.e. the Maxwell analogy for gravity [2] [3], initiated by Heaviside [1]), the more correct and the more precise interpretation is slightly different from the relativistic one, but the result is globally the same: the planets obtain slowing speeds at the perihelion side, and this is totally independent from any planets' environment.

4. The solar pressure

A third effect is caused by the solar radiation and matter expel which is pushing the planets away from the sun, the closer to the sun they are. Huge quantities of mass are continuously expelled, and when the planets are located at their perihelion, they experience the largest push. Here also, planets will tend to move to a wider orbit at that place.

5. Conclusion

It is clear that there are several reasons for the widening of the planets' orbits when they are near the sun, either by the planet's speed, either by the solar pressure. Also fast orbiting stellar binaries obey to the law of the decreasing eccentricity. In that case, the relativistic effect is the most important one.

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On the unexplained density of exoplanet TrES-4.

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1. Discovery of the exoplanet TrES-4.

The exoplanet TrES-4 has been discovered in 2007. Its density is 0.24 gr/cm³ and its diameter is 1.7 times that of Jupiter. The orbital radius is $7.3.10^9$ m and the orbital period is 3.5 days about a star which has a mass of 1.2 $M_{\odot}$. It is not known why such low-density planets can exist. Low-density planets should quickly become more dense, due to gravitation.

2. The eruption hypothesis.

One of the possible explanations is that the exoplanet TrES-4 is hollow. That means that the overall density could exist together with a large diameter. The conditions for such a hollow planet are given by the hypothesis that the planet is formed by an eruption of the star. Less than 0.2% of the star's mass would be an electromagnetic eruption made of ionized hydrogen (protons and electrons).

3. First support for the eruption hypothesis: our solar system.

The arguments for such an eruption lay in the extrapolation of the hypothesis of our planet systems' formation. In my paper "*Are Venus' and Uranus' Tilt of Natural Origin?*" I explain that the electromagnetic eruption of ionised hydrogen (in the form of protons and electrons) along magnetic paths that are external from the sun's surface, will make a spirally wound cloud along that magnetic path. The theory is proven to comply with the rotation velocity of Jupiter.

The hypothesis has been further developed in my paper "*The Titius-Bode Law Shows a Modified Proto-Gas-Planets' Sequence*" , wherein I discover that such a spirally wound cloud would perfectly fit with the actual distances of our gas-planets, if we consider that the proto-planet Neptune was originally located next proto-Jupiter, instead of next proto-Uranus. The correlation of the found sequence of the proto-planets versus the final and actual location of the planets is very high, because all other possible sequences of proto-planets totally fail. Moreover, the actual chemical composition of Neptune versus Jupiter does not contradict this hypothesis at all.

4. TrES-4 : a hollow cloud?

When I apply the eruption hypothesis to the exoplanet TrES-4, the planet would be a spirally wound cloud of protons and electrons, which each had another distance to the magnetic path, due to their different mass. The spirally wound cloud is then hollow, and inside the hollow sphere, the gravitation field is zero. The electric field is zero as well, if we consider either that the cloud's electrons were attracted again to the proton's cloud, either that the very light electrons are on the way to reach the much more heavy protons. In that way, the overall density of the cloud can be very low compared to its diameter. Due to the eruption of high temperature ionized hydrogen, the cloud is spinning about its axis. Due to these three effects, nor the gravitation field nor the electrical field will have much grip on making the cloud denser.

5. TrES-4 : a young planet?

If we give some credit to the eruption hypothesis, the distance of the exoplanet to its star is quite interesting. Since this distance is very short, and its orbital velocity high, I cannot but suggest that the exoplanet is not a very old planet, but rather only a proto-planet. I expect that the exoplanet's orbit radius will increase with time.
Indeed, the proto-planet will become more dense with time, just as Jupiter did. A supplementary argument of the large diameter of the exoplanet can be the high temperature of the cloud. But no data was available at the time of writing this paper.

6. Conclusion.

The electromagnetic stellar eruption hypothesis is a very promising explanation of the very low density of the exoplanet TrES-4. This explanation is supported by the excellent results of the solar eruption hypothesis, and by the corresponding nature of proto-planets created in this way.
The exoplanet is in that case rather a proto-planet and is expected not to come from a very ancient eruption.

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Fast spinnings stars' and black holes' dynamics.
Spherical and disk galaxy's dynamics.

Did the proto-gas planets' core lose mass before their final formation? Did β-decay of neutrons occur?

by using the Solar Protuberance Hypothesis and the Maxwell Analogy for Gravitation.

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Summary

Our gas planets and our core planets are formed as two groups from one solar protuberance. It appears that the ionized hydrogen (protons) generated the gas planets[2][3] and the corresponding amount of electrons generated the core planets[4][5]. In this paper, we will discuss the hypothesis that the order sequence of the proto- gas planets that we found[3] could imply that the neutrons that were involved in the process of the solar protuberance, possibly got β^- - decay. This hypothesis gives a probability fit of 99,7%. We also analyze the hypothesis that a part of the proto-gas planets' core mass got lost during the formation of the gas planets. For the latter hypothesis, we find a probability fit of 99,99%.

Keywords: *gas planets, neutrons, ionization, polarization.*
Method: *analytical.*
Notation: *decimal comma.*

Index

1. *Pro memore* : The solar protuberance.

The Titius-Bode law – The orbits of the planets are spread according a simple law.

In the paper "*The Titius-Bode law shows a modified proto- gas-planets' sequence*"[3], it appeared that the planets were probably born out of the sun due to a huge electromagnetic protuberance. A part of it, containing screwing ionized gazes, has been following an magnetic force line coming out of the sun, and was mainly composed of hydrogen and helium, supposed to be mainly electrically charged (ions). Thus, a spirally wound set of ring-segments arose from the sun, was then fractioned into proto-planets and finally became a set of planets.

The gas-part and the core-part – Basic concept

The protuberance was a solar eruption in which all types of the planets' atoms were already present. It caused the ejection of matter, about 0,15 % of the sun's total mass, at a speed of about 10^5 m/s for the proto-gas planets.

The hypothesis of a solar protuberance implies that the planets were created from one eruption only, but consisted of two (successive or simultaneous) eruption shocks: a first eruption shock of mainly hydrogen and some helium at one side of the protuberance (proto-Uranus, -Saturn, -Neptune, -Jupiter)[3], followed by a shock by the amount of electrons[4] (corresponding to the amount of ionized hydrogen of the gas planets) hitting a solar spot at the other side of the electromagnetic force line of that protuberance (proto-Mercury, -Mars, -Venus, -Earth)[5].

Disruption into proto-planets – Basics

How did the protuberance exactly split-up into proto-planets? Therefore we have to look at fig.1.1.

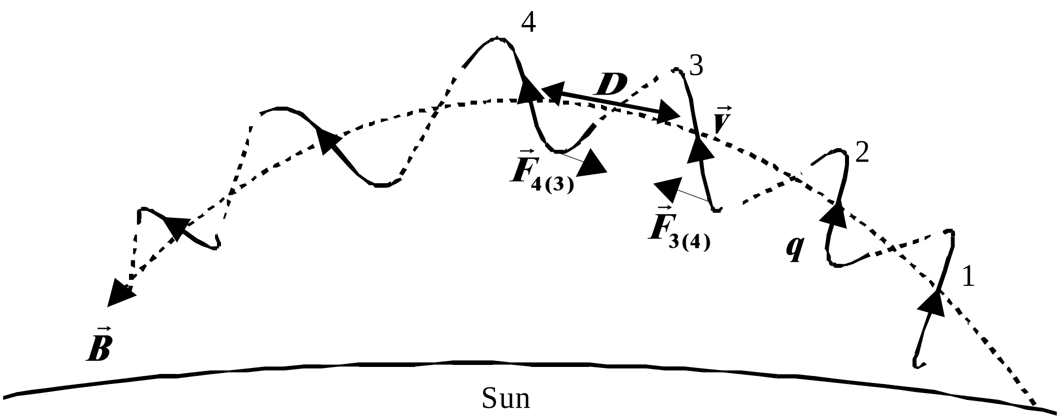

Fig.1.1*: Lorentz forces make the protons and electrons swivel about a magnetic path and Coulomb forces F pull and break apart the zones of the solar protuberance into parts.*

Since there are four gas planets known, I have restricted the number of parts to four, assuming that the gas planets don't influence the core planets formation.
Each part of the screwing hot cloud will undergo a force from the other parts. So, it follows that the cloud will expand in length, allowing the final separation of the parts into proto-planets. The distance ***D*** between each part is assumed to be the same for the whole protuberance. The Coulomb forces will disrupt the ionized screwing cloud into parts and create a steadily decreasing acceleration of the disrupted parts until they get a constant orbital velocity that is strictly related to their orbit radius by the geometrical law $\boldsymbol{a = v^2 / r}$ (for circular orbits).

2. The best fit for the proto-gas-planets.

A perfect fit for the proto- gas planets – Statistical fit of 100%.

When I tested the best fit for the proto- gas planets[3], it appeared that the sequence order had to be proto-Uranus, -Saturn, -Neptune and -Jupiter, as shown in table 2.1.

	Proto planets	M [kg] (xE24)	q [C]	F (N)	a [m/s²]	r (xE9)	a/r
			mutually comparative figures only				
1	Jupiter	1899	1899	120417,7	63,41	778,6	12,28
2	Neptune	102	102	-33387,15	-327,33	4495,1	-13,73
3	Saturn	568	568	-69572,9	-122,49	1433,5	-11,7
4	Uranus	86,8	86,8	-17457,65	-201,13	2872,5	-14,28
						***X* =**	**0,997**

Table 2.1 : *The best fit for the proto- gas planets, where 'q' is the electrical charge, 'F' the Coulomb force between the considered proto-planet versus the other proto-planets, ''a the corresponding acceleration, 'r' the actual orbit radius, X the statistical fit indicator. X = 0,997 means a fit of 99,7%.*

Remark the statistical value $\boldsymbol{X}$ for $\boldsymbol{a/r}$ which becomes $\boldsymbol{X}$ = 0,997 . The value $\boldsymbol{X}$ is determinative for the fit of the values between the proto- gas planets' sequence and the actual orbits of the planets.

This is found when applying the statistically based equation:

$$\sqrt{\sum_{i=1}^{4}\left(a_i/r_i\right)^2} \Big/ \sum_{i=1}^{4}\left|a_i/r_i\right| \qquad (2.1)$$

We can then compare the proto-planets' accelerations and the today's orbital radii. The results can be found by using (2.1) and the values will be situated between 0 (perfect fit) and 0,5 (worst fit). The statistical validity of (2.1) is not proved here and we consider it only as an indicator and a valuation method for the results.

If we want to transform the gradation from 0 (or 0% , worst fit) to 1 (or 100% , perfect fit) we need to use (2.2).

$$X = 2\left(1 - \sqrt{\sum_{i=1}^{4}\left(a_i/r_i\right)^2} \Big/ \sum_{i=1}^{4}\left|a_i/r_i\right|\right) \qquad (2.2)$$

If the positive sign for $\boldsymbol{a/r}$ in the table 2.1 means a prograde orbit, the negative sign means a retrograde orbit. However, I showed in a former paper[3] that any retrograde orbit swivels into a prograde orbit in time, due to the transmission of the Sun's angular momentum to the surrounding space, by the means of gyro-gravitation[3].

Did we test the proto- planets' sequence correctly? – All matter was supposed to have been ionized.

During the study about the proto-gas planets, we have considered that all the matter was ionized, because a major part of the planets is made is hydrogen. But in reality, other chemical element have a considerable weight in the total mass. So, the values of the electrical charge $\boldsymbol{q}$ in the table 2.1 should not be equivalent to the mass (one nucleon for one charge) but to the equivalent number of protons (and no neutrons) related to the mass.

Below, we have shown the chemical composition of the gas planets, where is shown that considerable amounts of neutrons will play no role at all in the electromagnetic solar protuberance.

Element (wt%)	Atomic Mass	Jupiter	Saturn	Uranus	Neptune	Pluto
H	1	*90,00*	*93,00*	*59,00*	*74,00*	
He	2	*10,00*	*3,00*	*10,00*	*22,00*	
Rocky core (estimate)	25		*3,00*	*30,00*	*3,00*	*70,00*
Water	10					*30,00*
Total (wt%)		*100,00*	*99,00*	*99,00*	*99,00*	*100,00*
Total mass (10^{24}kg)		*1899*	*568*	*86,8*	*102*	*0,0125*

Table 2.2 [11] : *A considerable amount of neutrons will play no role at all in the electromagnetic solar protuberance.*

These amounts has to be subtracted from the values of the electrical charge $\boldsymbol{q}$ in the table 2.1. In the next chapter, we will correct the values and make a very strange discovery.

3. Re-evaluating the gas planets' order.

When we change the electrical charge of the nuclei that content neutrons to half the charge of their equivalent weight, we have to take the hydrogen nuclei for 100% and the other nuclei for approximately 50% to 55% of their weight. Remember, the figures are not absolute, but can be compared mutually.

By doing this, we come to the table 3.1. below. After using the equation (2.2) , we find for the statistical value $\boldsymbol{X}$ = 0,988 , which means an comparative fit of 98,8%.
No other proto- gas planets' sequence order fits better than that of table 3.1. and the second choice gives us a fit of only 94% ($\boldsymbol{X}$ = 0,94).

	Proto planets	**M [kg] (xE24)**	**q [C]**	**F (N)**	**a [m/s²]**	**r (xE9)**	**a/r**
			mutually comparative figures only				
1	**Jupiter**	1899	1804,05	105283,16	55,44	778,6	14,04
2	**Neptune**	102	88,74	-27480,08	-269,41	4495,1	-16,68
3	**Saturn**	568	548,12	-64506,39	-113,57	1433,5	-12,62
4	**Uranus**	86,8	69,01	-13296,68	-153,19	2872,5	-18,75
						***X* =**	**0,988**

Table 3.1: *The best fit for the proto- gas planets, where 'q' is the electrical charge that is reduced to the number of protons, by deduction of the neutrons, 'F' the Coulomb force between the considered proto-planet versus the other proto-planets, ''a the corresponding acceleration, 'r' the actual orbit radius, X the statistical fit indicator. X = 0,988 means a fit probability of 99%.*

Since here we find 'only' $\boldsymbol{X}$ = 0,988 whereas in table 2.1 we found $\boldsymbol{X}$ = 0,997 , it means that the probability of a wrong proto- gas planets' sequence is below 1,2%. And for table 2.1, it is below 0,3%.

Hence, it seems not very realistic that the found values of the charge in table 3.1 are correct, although we tried to find the most reasonable correction to the table 2.1. But there is another possibility. How sure can we be that all the erupted matter found its way inside the proto-planets?

4. The hypothesis of the lost matter.

When the solar protuberance took place, the ionized matter screwed about a magnetic path. All the matter wasn't however ionized : the neutrons didn't ionize and the larger and heavier the atoms, the less percentage protons occur and the less nucleons are ionized. That made these nuclei screw much farther away from the magnetic path due to the larger inertial mass compared to the Lorentz force that acts on the nuclei.
It might be possible that the heaviest particles haven't been cached by the proto-planets and got lost in space.

If we consider that the planets' cores were 50% larger than they are in the final planets, we get the table 4.1. In that table, we have taken the electrical charge to be 100% of the hydrogen and 50% of the core.

	Proto planets	M [kg] (xE24)	q [C]	F (N)	a [m/s²]	r (xE9)	a/r
			mutually comparative figures only				
1	**Jupiter**	1899	2074,66	148934,21	78,43	778,6	9,93
2	**Neptune**	102	123,35	-44440,15	-435,69	4495,1	-10,32
3	**Saturn**	568	605,67	-80337,67	-141,44	1433,5	-10,14
4	**Uranus**	86,8	111,44	-24156,4	-278,3	2872,5	-10,32
						X =	**0,9999**

Table 4.1: *The best fit for the proto- gas planets, where the mass of the core has been augmented with 50% and 'q' is the electrical charge that is reduced to the number of protons, by deduction of the neutrons, 'F' the Coulomb force between the considered proto-planet versus the other proto-planets, ''a the corresponding acceleration, 'r' the actual orbit radius, X the statistical fit indicator. X = 0,9999 means a fit probability of 99,99%.*

This result suggests that a part of the core could have been lost (in our example of table 4.1 : 33%) during the formation of the planets, while it was present at the solar eruption.

5. Discussion and conclusion.

The analysis of the solar protuberance was firstly done while considering that all the mass could have been ionized during the formation of the proto- gas planets. This gave a fit of 99,7%. The consequence of this assumption is that also the neutrons of the protuberance could have been ionized for a short time (β^- - decay) and maybe rearranged into nuclei by electrons capture, because afterwards, some core has been formed in the gas planets, which by definition should contain neutrons for about half the number of their nuclei.
In the second analysis I corrected that and I used only half of the nuclei's masses to find their equivalent number of electrical charge. This gave a less good fit of 98,8%. This is indeed not that far from the 99,7% fit for the case where we used the core mass and the electrical charge in a proportion 1:1.

It is clear that the absolute difference of 0,9% between both results cannot be a worthily support for a totally new theory about neutrons that would admit a β^- - decay of neutrons due to the high temperature and the electromagnetic influence. In order to obtain the actual cores of the gas planets, we would have to assume that there was a rearrangement of the nuclei into protons and neutrons just after the β^- - decay, by the absorption of electrons. Literature however never mentioned β^- - decay and spontaneous re-caption of electrons by protons in nuclei. The best neutrons can do is to polarize.

But we also fixed two parameters that are used for calculating the fitting, which also could influence the result.
In the first place, we consider that the four proto- gas planets were equidistant, which is not certain. In a former paper concerning the core-planets, we have introduced a smaller distance between two proto-planets and we have got a better fit. This however made us play with parameters for a better fit, which is at least a suspicious method.
The second parameter concerns the following: we don't know to what extend the acceleration decrease evolved while the proto-planets began to mutually expand under the Coulomb forces. The values of the initial accelerations are not a full guarantee for the final values of the orbit radii.

From one thing we can be quite sure, the fit of the found proto- gas planets' original sequence order proto-Uranus, -Saturn, -Neptune, -Jupiter appears to be quite stable, even if small variations of the parameters are introduced.

At the other hand, would it have been better if we had found a fit of only, say 95%, for the table 3.1?
Probably it would made us believe that the neutrons really did short-time "ionize", but even then, an accidental fit of the figures still would have been possible, due to the two remaining parameters that could differ from our assumptions.

I conclude that, however very unlikely, a possible "ionization" of neutrons in the solar protuberance can be examined according an assumed strength of the magnetic field and a very high temperature.

In the second hypotheses, which is much more likely, I increased the original mass of the proto-planets' core with 50%, while keeping the non-hydrogen ionization to 50% and I came to a fit level of 99,99%. This result suggests that the cores have lost nearly 30% of their weight into space during the formation of the planets. The asteroids, the moons and the planets' rings are only a part of that loss. Of course, the figures we found are only indications of possible hypotheses that merit to be analyzed further. They are no proof by themselves.

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Many thanks go to Roger Rydin, who patiently informed me in a private correspondence about Charles Lucas' exciting and promising Classical Electro-dynamic Theory of the Nucleus, that was greatly improved by Roger's work.

3

Accumulation of evidence from the Core Planets

Can the same be said from the core planets? In this chapter, I have put two papers that treat on the core planets.

The first paper is treating the formation of the proto-core-planets.
Strong evidence is found that both the core planets and the gas planets came from the same electromagnetic explosion, and moreover, by the dynamical approach of impulse moments.

The second papers analyzes the order sequence of the proto-core-planets and their final orbits, under the influence of the electromagnetic protuberance from the Sun.
Although the fit is less convincing than for the gas planets, it is still a remarkable support in favor of the Solar Protuberance Theory.

Discover now the amazing creation of our own and of the other planets!

Is the Earth a former solar sunspot?

by using the Solar Protuberance Hypothesis and the Maxwell Analogy for Gravitation.

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Summary

In two former papers, "*Are Venus' and Uranus' Tilt of Natural Origin?*" and "*The Titius-Bode law shows a modified proto- gas-planets' sequence.*" I show that the solar protuberance-model is a quite interesting hypothesis for the explanation of the planets' origin. This model comes to the following conclusions up to now. In "*Are Venus' and Uranus' Tilt of Natural Origin?*", I started with the hypothesis that *0,15 %* of the sun erupted. I found that this eruption formed the planets. To prove this, I used the observed sun's temperature as the eruption temperature, and the data then comply with the rotation velocity of Jupiter and with the orbit velocity of Mercury. I needed the Maxwell Analogy for Gravitation to come to prograde orbits for all planets.
When, in "*The Titius-Bode law shows a modified proto- gas-planets' sequence.*", I tried to find the dynamics of the solar protuberance-model, I came to the unexpected conclusion that proto-Neptune originated close to Jupiter at first and was repelled to its actual orbit. The chemical composition of the planets shows that Neptune indeed is not at its 'natural' place.

In this paper, I analyse the electrical dynamics of the protuberance and I come to the conclusion that the gas-planets and the core-planets were created simultaneously. With the solar protuberance-model, I can calculate the correct total mass of the core-planets out of the conservation of momentum against the gas-planets. While the gas-planets have been created by a certain number of protons out of an electromagnetic solar protuberance, exactly the same number of electrons have created the core planets. In fact, the impulse of the gas-protuberance was the protons-side and it perfectly corresponds to the impulse of the core-planets at the electrons-side.

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1. A huge solar protuberance.

The spread of the gas-planets – The gas-planets follow the Titius-Bode law.

Solar flares and post-flare loops are very common events at the sun's surface. Prominences, which reach further from the sun's surface are common as well. All these phenomena are provoked and maintained in suspension by the magnetic fields of the sun.

So many eruption types can take place that in the meantime we simplify our eruption model. We consider an exceptionally huge prominence (eruption) that follows a magnetic field path.

The gas-part and the core-part – Basic concept

As explained in my first paper, the protuberance was a solar eruption in which all types of the planet's atoms were already present. It caused the ejection of matter, about 0,15 % of the sun's total mass, at a speed of about 10^5 *m/s.*

We will analyse the hypothesis of a solar protuberance and verify if the planets were created from one eruption only, or consisted of two (successive or simultaneous) eruption shocks: a first eruption shock of mainly hydrogen and some helium at one side of the protuberance (proto-Uranus, -Saturn, -Jupiter, -Neptune), followed by an implosion-explosion shock hitting a solar spot at the other side of the electromagnetic force line of that protuberance (proto-Mercury, -Venus, -Earth, -Mars).

2. The internals of a solar protuberance.

The electromagnetic properties of a solar protuberance – A screwing hot cloud

When the protuberance or eruption is formed, and taking in account the second shock, hitting the solar spot, the serie of proto-planets has the following shape. When mass ejections occur, at a temperature of $1{,}5\ .10^{7}K$, the ionised hydrogen and the electrons follow a magnetic path which quit one electric pole and go to another pole, creating so a magnetic buckle outside the sun's surface (fig.2.1).

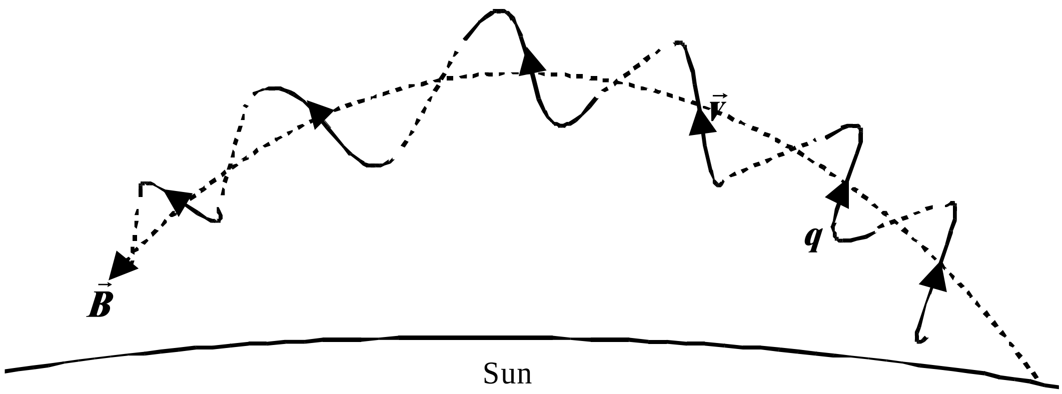

Fig.2.1

In fig.2.1 , $\boldsymbol{B}$ is the magnetic field, q the electric charge and $\boldsymbol{v}$ the screwing speed of the hot cloud. Remark that the dynamics of the cloud are almost solely defined by the positive hydrogen ions. The mass of electrons is too insignificant to influence these dynamics. The electrons will screw very tightly about the electromagnetic force line, in the inverted screwing direction of the hydrogen- and helium ions.

The rotation speed of the proto-gas-planets has been found in former paper out of some thermodynamic considerations of the sun, and this speed complies very good with the actual rotation speed of Jupiter.

Conservation of momentum – Basic statement

Let us have a look at fig.2.1 again. At one side of the protuberance, the ionized hydrogen leaves the surface of the sun and screws in the direction of the other side. The ionized hydrogen, and some ionized helium are only protons and neutrons.

The total electric charge is directly proportional to the sum of the gas-planets' masses. According to the table 2.1 this total mass equals $\boldsymbol{M_{gas} = 2{,}66.10^{27}\,kg}$. We consider that most of the mass consists of protons. All of the mass of the proto-gas-planets is made of gasses. Thus, we can say that $\boldsymbol{M_{gas} \approx M_p}$, where $\boldsymbol{M_p}$ is the mass of the corresponding ionized gasses related to the proto-gas-planets.

		SUN	MERCURY	VENUS	EARTH	MARS	JUPITER	SATURN	URANUS	NEPTUNE	PLUTO
Mass	(10^{24}kg)	*1989000*	*0,33*	*4,87*	*5,97*	*0,642*	*1899*	*568*	*86,8*	*102*	*0,0125*
Diameter	(10^3 m)	*1390000*	*4879*	*12104*	*12756*	*6794*	*142984*	*120536*	*51118*	*49528*	*2390*
Density	(kg/m^3)		*5427*	*5243*	*5515*	*3933*	*1326*	*687*	*1270*	*1638*	*1750*
Rotation Period	(hours)		*1407,6*	*-5832,5*	*23,9*	*24,6*	*9,9*	*10,7*	*-17,2*	*16,1*	*-153,3*
Distance from Sun	(10^9 m)		*57,9*	*108,2*	*149,6*	*227,9*	*778,6*	*1433,5*	*2872,5*	*4495,1*	*5870*
Orbital Period	(days)		*88*	*224,7*	*365,2*	*687*	*4331*	*10747*	*30589*	*59800*	*90588*
Orbital Inclination	(degrees)		*7*	*3,4*	*0*	*1,9*	*1,3*	*2,5*	*0,8*	*1,8*	*17,2*
Orbital Eccentricity	Eccentricity		*0,205*	*0,007*	*0,017*	*0,094*	*0,049*	*0,057*	*0,046*	*0,011*	*0,244*
Axial Tilt	(degrees)		*0,01*	*177,4*	*23,5*	*25,2*	*3,1*	*26,7*	*97,8*	*28,3*	*122,5*

table 2.1

At the other side of the protuberance, a same quantity of negative electric charge is appealed for by the ionized hydrogen and helium.
Let us start with the hypothesis that at that place, the surface of the sun was a sunspot. We will check now if this hypothesis fits with the observed data.

The quantity of negative electric charge at the sunspot side must be the same as the positive electric charge at the hydrogen side of the protuberance.

Now, we look what happened just before the eruption. The total hydrogen mass involved at one side of the magnetic path is given by $\boldsymbol{M_p = 2{,}66.10^{27}\,kg}$. And all that mass is made of protons only. At the sunspot side, we have lots of iron and many other chemical elements.

The sunspot has been hit by the electric flow of the electrons. Indeed, the ionized hydrogen did not hit the sunspot, but only the electrons did. The electrons followed a spirally path, very close to the magnetic path of the protuberance, while the ionized hydrogen followed a widely spread spirally path along the same magnetic path.

The conservation of momentum defines that the momentum of the erupted mass of electrons $\boldsymbol{M_e}$ must be equal to the momentum of the mass $\boldsymbol{M_s}$ of the erupted sunspot matter:

$$\boldsymbol{M_e\, v_e = M_s\, v_s} \qquad (2.1)$$

Thus, the hypothesis that the electrons hit the sunspot and so created a pure mechanical process of impulses, will be checked here.

We know the velocity of the ionized hydrogen from "*Are Venus' and Uranus' Tilt of Natural Origin?*", at the moment of eruption, which is $\boldsymbol{v_p = 2{,}5\,.\,10^5\; m/s}$. This velocity could be deducted from the sun's temperature only, although the quite low accuracy we have got from it. Therefore we have taken the real velocity of the gasses in Jupiter, of which I believe that it is as close as possible from the original protons' velocity. The velocity of the electrons has to be the same, because the ionization of the hydrogen splits the protons and the electrons, and only the temperature of the sun is responsible for the velocity of both the protons and the electrons along the magnetic path, according my former paper. Hence : $\boldsymbol{v_e = v_p}$.

In the paper "*Are Venus' and Uranus' Tilt of Natural Origin?*" I also calculated the approximative velocity of the core planets. Since the accuracy of that calculation is too low, we shall use the real velocities of the core-planets here. However, this does not harm the validity of the reasoning in this paper.
The average orbital velocity of the core-planets represent the velocity of the erupted sunspot. Thus, by using the figures of table 2.1, and by applying the planets' mass-related load factors, we find an average velocity of about $\boldsymbol{v_s = 0{,}3\ .\ 10^5\ m/s}$. And finally, the total mass $\boldsymbol{M_e}$ of the electrons that are involved is :

$$\boldsymbol{M_e = M_p \frac{m_e}{m_p}} \qquad (2.2)$$

where $\boldsymbol{m_e}$ and $\boldsymbol{m_p}$ are the elementary masses of the electron and the proton.

Hence, $$\boldsymbol{M_e = 2{,}66.10^{27} \frac{m_e}{m_p} kg = \frac{2{,}66.10^{27}}{1838} kg} \qquad (2.3)$$

It is possible to calculate the total mass of the ejected part of the sunspot $\boldsymbol{M_s}$ out of (2.1), combined with (2.3):

$$\boldsymbol{M_{sunspot} = \frac{2{,}5.10^5\ m/s\ .\ 2{,}66.10^{27}\ kg}{1838\ .\ 0{,}3.10^5\ m/s}} \qquad (2.4)$$

or

$$\boldsymbol{M_{sunspot} = 12\ .\ 10^{24}\ kg} \qquad (2.5)$$

which indeed is, with a very good approximation, the sum of the masses of the core-planets, which is $\boldsymbol{11{,}8\ .\ 10^{24}\ kg}$. The velocities used in (2.4) are correct within a small error margin. The asteroid belt should be considered as a part of the gas-planets' composition, but its mass is marginal anyway.

What can we deduct about the sunspot?
In a sunspot, there are many different chemical elements present in different quantities. As a matter of fact, the equation (2.5) implies that the sum of the core-planets is a good representation of the content of a sunspot. When we look at table 2.2 , we have an idea of the elements which are present in our core-planets.

Element (wt%)	Atomic Mass	Mercury	Venus	Earth	Mars
Fe	26	*64,47*	*31,17*	*32,07*	*9,50*
O (bound)	8	*14,44*	*30,90*	*30,12*	*45,00*
Si	14	*7,05*	*15,82*	*15,12*	*25,00*
Mg	12	*6,50*	*14,54*	*13,90*	*17,00*
S	16	*0,24*	*1,62*	*2,92*	
Ni	28	*3,66*	*1,77*	*1,82*	
Ca	20	*1,18*	*1,61*	*1,54*	*1,50*
Al	13	*1,08*	*1,48*	*1,41*	
Total (wt%)		*98,62*	*98,91*	*98,90*	*98,00*
Total mass (10^{24}kg)		*0,33*	*4,87*	*5,97*	*0,642*

table 2.2

3. Conclusion : good probability of a simultaneous creation of all our planets.

From the former papers followed that the solar protuberance is a valid hypothesis as the origin of the formation of our planets. There is a strong probability that the gas-planets came out of the same protuberance, and the sole needed data was the sun's internal temperature, which is given by the fusion process of hydrogen to helium. I have given the configuration of the proto-gas-planets' sequence inside the originally erupted cloud, which was different from the one now. The calculation of this sequence came out as the only possibility out of 24 theoretical sequences. And this configuration solved the origin of the Titius-Bode law.

Now, we find evidence that while the core-planets have been created by the impact of the electrons of the protuberance, the gas-planets must have been created by the impact of the same number of protons. Thus, the same protuberance process created all the planets at the same eruption process, but the group of core planets very probably came out of a sunspot at one side of the protuberance and the group of gas-planets very probably came out the sun's hot surface at the other side of the protuberance.
By the addition of the core planets' chemical content, we obtained the composition of a typical sunspot.

If the hypothesis of a huge protuberance is valid, it also implies that if we discover exo-planets somewhere (generally these are large gas-planets) , there is also a good chance to find core-planets as well, and consequently a higher chance of intelligent life than we could ever have imagined before.

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The core-planets' tilt and spin rate can be explained by the Solar Protuberance Hypothesis and Gyro-Gravitation.

by using the Solar Protuberance Hypothesis and the Maxwell Analogy for Gravitation.

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Summary

Several of my former papers showed that a huge solar protuberance created the gas planets of our solar system. A c*uriosum* is the changed sequence order of the actual gas planets compared with their sequence order when the solar protuberance has occurred.
In my paper *"Is the Earth a Former Solar Sunspot?"*, strong evidence was given that the core planets as well were created by the same solar explosion : the impulse of the protons related to the exploded gas-planets out of the sun, corresponded perfectly with the impulse of the equivalent number of electrons that were related to the explosion of the core-planets, at the same instant.
In the present paper, I come to the second *curiosum*, that the proto-planets Mercury and Venus have been ejected in a retrograde orbit, and the proto-planets Earth and Mars have been ejected in a prograde orbit.
We show why Mercury and Venus came back in a prograde orbit and why both planets have a very slow spin rate, while the Earth and Mars have almost the same spin rate.
Finally, we find that the ejection of the four planets corresponds with the remarkable Titius-Bode law as well.

Key words - solar sunspot, core planets, solar protuberance, retrograde orbit.
Method - Analytical.
Notation - Decimals with comma.

Index

1. The solar protuberance. - *pro memore*

The gas-part and the core-part – Basic concept

As explained in my former papers, the protuberance was a solar eruption in which all types of the planet's atoms were already present. It caused the ejection of matter, about 0,15 % of the sun's total mass, at a speed of about 10^5 m/s .
The hypothesis of a solar protuberance implies that the planets were created from one eruption only, but consisted of two (successive or simultaneous) eruption shocks: a first eruption shock of mainly hydrogen and some helium at one side of the protuberance (proto-Uranus, -Neptune, -Saturn, -Jupiter), followed by an implosion-explosion shock due to the hydrogen shock wave hitting a solar spot at the other side of the electromagnetic force line of that protuberance (proto-Mercury, -Venus, -Earth, -Mars).

The electromagnetic properties of a solar protuberance – A screwing hot cloud

When the protuberance or eruption is formed, and taking in account the second shock, hitting the solar spot, the serie of proto-planets has the following shape. When mass ejections occur, at very high temperature, the ionised hydrogen and the electrons follow a magnetic path which quit one sunspot pole and go to the other pole, creating so a magnetic buckle outside the sun's surface (fig.1.1).

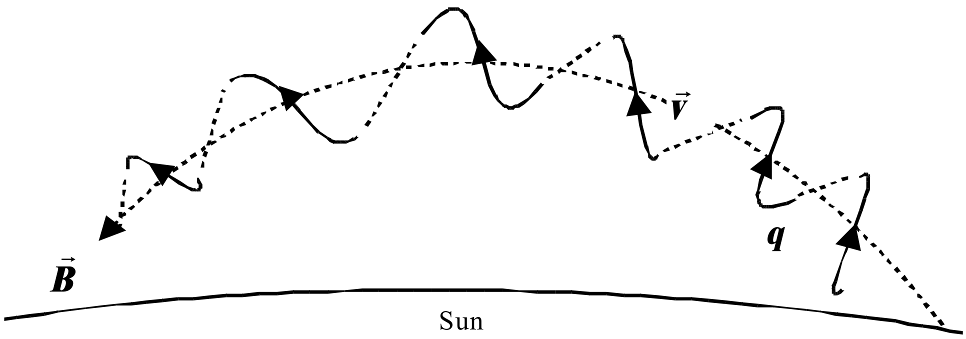

Fig.1.1*: protuberance hypothesis: ions, protons spiralling about a magnetic path.*

In fig.1.1 , **B** is the magnetic field, **q** the electric charge and **v** the screwing speed of the hot cloud. Remark that the dynamics of the cloud are almost solely defined by the positive hydrogen ions. The electrons will screw very tightly about the electromagnetic force line, in the inverted screwing direction of the hydrogen- and helium ions.

Disruption into proto-planets – Basic equations

How did the protuberance exactly split-up into proto-planets? Therefore we have to look at fig.1.2.

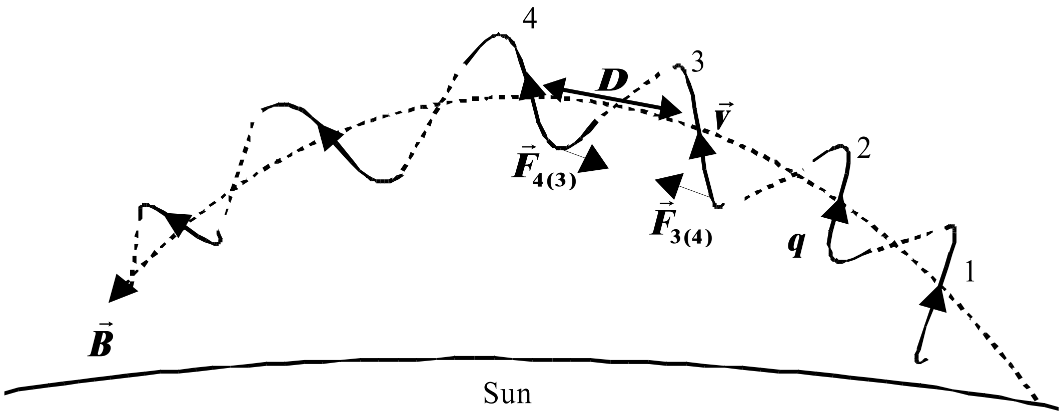

Fig.1.2*: Lorentz and Coulomb forces in the solar protuberance.*

Since there are four core planets known, I will restrict the number of parts to four, assuming that the gas planets don't influence the core planets formation.
Each part of the screwing hot cloud will undergo a force from the other parts. So, it follows that the cloud will expand in length, allowing the final separation of the parts into proto-planets. The distance D between the parts is assumed to be the same for the whole protuberance.
In the drawing, I have shown two examples of forces: $F_{4(3)}$ and $F_{3(4)}$ which mean respectively the force on part 4 due to part 3, and the force on part 3 by the part 4.
For simplicity, I consider the X-axis positive to the right side, and I disregard the bending of the magnetic force line. This is allowed because, at the end, all the planets move in elliptic orbits, and the starting direction of the proto-planets at this stage of the study is then of little importance.

The forces can then be written as follows.

For part 1 (the first proto-core-planet):

$$\boldsymbol{F}_{1(2)} = \frac{\boldsymbol{q}_1 \boldsymbol{q}_2}{4\pi \varepsilon_0 \boldsymbol{D}^2} \qquad \boldsymbol{F}_{1(3)} = \frac{\boldsymbol{q}_1 \boldsymbol{q}_3}{4\pi \varepsilon_0 (2\boldsymbol{D})^2} \qquad \boldsymbol{F}_{1(4)} = \frac{\boldsymbol{q}_1 \boldsymbol{q}_4}{4\pi \varepsilon_0 (3\boldsymbol{D})^2}$$

Hence :

$$\boldsymbol{F}_1 = \sum_{i=2}^{4} \boldsymbol{F}_{1(i)} = \frac{\boldsymbol{q}_1 (36\boldsymbol{q}_2 + 9\boldsymbol{q}_3 + 4\boldsymbol{q}_4)}{144 \pi \varepsilon_0 \boldsymbol{D}^2} \tag{1.1}$$

and the acceleration a $_1$ of the part 1 with mass m$_1$ is :

$$\boldsymbol{a}_1 = \frac{\boldsymbol{F}_1}{\boldsymbol{m}_1} \tag{1.2}$$

For the acceleration of the other parts of course, a similar equation as (2.2) exists.

For part 2 :

$$\boldsymbol{F}_{2(1)} = \frac{-\boldsymbol{q}_2 \boldsymbol{q}_1}{4\pi \varepsilon_0 \boldsymbol{D}^2} \qquad \boldsymbol{F}_{2(3)} = \frac{\boldsymbol{q}_2 \boldsymbol{q}_3}{4\pi \varepsilon_0 \boldsymbol{D}^2} \qquad \boldsymbol{F}_{2(4)} = \frac{\boldsymbol{q}_2 \boldsymbol{q}_4}{4\pi \varepsilon_0 (2\boldsymbol{D})^2}$$

Hence :

$$\boldsymbol{F}_2 = \sum_{i=1,3,4} \boldsymbol{F}_{2(i)} = \frac{\boldsymbol{q}_2(-4\boldsymbol{q}_1 + 4\boldsymbol{q}_3 + \boldsymbol{q}_4)}{16\pi \varepsilon_0 \boldsymbol{D}^2} \tag{1.3}$$

For part 3 :

$$\boldsymbol{F}_{3(1)} = \frac{-\boldsymbol{q}_3 \boldsymbol{q}_1}{4\pi \varepsilon_0 (2\boldsymbol{D})^2} \qquad \boldsymbol{F}_{3(2)} = \frac{-\boldsymbol{q}_3 \boldsymbol{q}_2}{4\pi \varepsilon_0 \boldsymbol{D}^2} \qquad \boldsymbol{F}_{3(4)} = \frac{\boldsymbol{q}_3 \boldsymbol{q}_4}{4\pi \varepsilon_0 \boldsymbol{D}^2}$$

Hence :

$$\boldsymbol{F}_3 = \sum_{i=1,2,4} \boldsymbol{F}_{3(i)} = \frac{\boldsymbol{q}_3(-\boldsymbol{q}_1 - 4\boldsymbol{q}_2 + 4\boldsymbol{q}_4)}{16\pi \varepsilon_0 \boldsymbol{D}^2} \tag{1.4}$$

For part 4 :

$$\boldsymbol{F}_{4(1)} = \frac{-\boldsymbol{q}_4 \boldsymbol{q}_1}{4\pi \varepsilon_0 (3\boldsymbol{D})^2} \qquad \boldsymbol{F}_{4(2)} = \frac{-\boldsymbol{q}_4 \boldsymbol{q}_2}{4\pi \varepsilon_0 (2\boldsymbol{D})^2} \qquad \boldsymbol{F}_{4(3)} = \frac{-\boldsymbol{q}_4 \boldsymbol{q}_3}{4\pi \varepsilon_0 \boldsymbol{D}^2}$$

Hence :

$$F_4 = \sum_{i=1}^{3} F_{4(i)} = \frac{-q_4\,(4q_1 + 9q_2 + 36q_3)}{144\,\pi\,\varepsilon_0\,D^2} \tag{1.5}$$

The order of the proto-planets however is not known, and we have to find this out by reasoning or by trying out all the possibilities.

2. Evaluating the core planets' order.

The core planets' order based on the actual physical data *– A normal sequence order.*

In the table 2.1 we see that the core planets' order seems to be quite normal compared with the sequence order of the gas planets, which at their creation (proto-planets) were having the sequence order proto-Uranus, -Saturn, -Jupiter, -Neptune.
The core-planets show first a small planet and ends-up with a small planet as well, just as the shape of a usual solar protuberance.

With (1.2), the acceleration of the parts of the protuberance can be calculated, taking in account the electrical charges, which are directly proportional with the known planetary masses. In fact, unlike the gas-planets, where the main element is hydrogen, with an electrical charge of 1 versus the atomic mass, the core-planets will have an electrical charge of ½ versus the atomic mass of the elements, because the neutrons are equally present as the protons.

		SUN	MERCURY	VENUS	EARTH	MARS	JUPITER	SATURN	URANUS	NEPTUNE	PLUTO
Mass	(10^{24}kg)	*1989000*	*0,33*	*4,87*	*5,97*	*0,642*	*1899*	*568*	*86,8*	*102*	*0,0125*
Diameter	(10^3 m)	*1390000*	*4879*	*12104*	*12756*	*6794*	*142984*	*120536*	*51118*	*49528*	*2390*
Density	(kg/m^3)		*5427*	*5243*	*5515*	*3933*	*1326*	*687*	*1270*	*1638*	*1750*
Rotation Period	(hours)		*1407,6*	*-5832,5*	*23,9*	*24,6*	*9,9*	*10,7*	*-17,2*	*16,1*	*-153,3*
Distance from Sun	(10^9 m)		*57,9*	*108,2*	*149,6*	*227,9*	*778,6*	*1433,5*	*2872,5*	*4495,1*	*5870*
Orbital Period	(days)		*88*	*224,7*	*365,2*	*687*	*4331*	*10747*	*30589*	*59800*	*90588*
Orbital Inclination	(degrees)		*7*	*3,4*	*0*	*1,9*	*1,3*	*2,5*	*0,8*	*1,8*	*17,2*
Orbital Eccentricity	Eccentricity		*0,205*	*0,007*	*0,017*	*0,094*	*0,049*	*0,057*	*0,046*	*0,011*	*0,244*
Axial Tilt	(degrees)		*0,01*	*177,4*	*23,5*	*25,2*	*3,1*	*26,7*	*97,8*	*28,3*	*122,5*

table 2.1[16]

Now, let us look at the chemical composition of the core planets and try to deduce the proto-planet sequence order that possibly is the most appropriate choice.

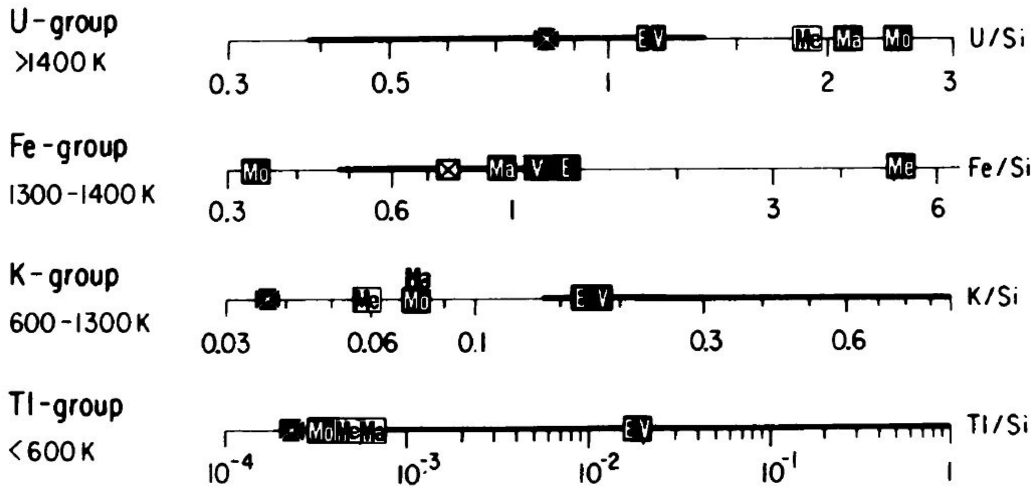

Fig. 2.1[17]*: Chemical composition of the core planets and the Moon.*

In fig.2.1, we show the relative compositions of the planets Mercury (Me), Venus (Ve), Earth (E), Mars (Ma) and the Moon (Mo). Since our hypothesis is that the core-planets are originated from a solar sunspot, we will especially look at the iron composition, because the distribution of other elements in solar sunspots are not known.

In the whole fig.2.1 , we find Venus and Earth close together. For Mars, we also get figures that are relatively close to Venus and Earth, especially for the content of iron. Only Mercury shows a higher relative content of iron, compared with the other core planets.

Based on this table, we can only conclude that the Earth and Venus were probably grouped as proto-planets. Mercury has a stronger iron content, and Mars and Mercury got a composition that is very close to that of the Earth and Venus.

Comparing the actual planets and the proto-planets' sequence order. *– the basic order is incorrect.*

When the equations (1.1) to (1.5) are used for the four core-planets, we can find 4! = 24 solutions for the original proto-planets' sequence order. Since the order 1,2,3,4 is fully symmetrical to the order 4,3,2,1 , we will only get 4!/2 significant sequence order possibilities of the proto-planets. Hopefully, only one solution of them will give a good correlation between the actual orbit positions of the planets, compared with the original order sequence that is tested.

	Proto planets	M [kg] (xE24)	q [C]	F (N)	a [m/s²]	r (xE9) orbit
			Comparative figures.			
1	**Mercury**	0,33	0,33	0,53	1,61	57,9
2	**Venus**	4,87	4,87	7,06	1,45	108,2
3	**Earth**	5,97	5,97	-6,43	-1,08	149,6
4	**Mars**	0,64	0,64	-1,16	-1,81	227,9

Table 2.2 : *test for a proto-planets' sequence order. We chose the same order of the proto-planets as their actual sequence order.*

In the table 2.2 , the equations (2.1) to (2.5) are applied on the supposition that the core planets' positions in the large sun's protuberance were originally the same as the actual ones.

It is clear that the values of the Coulomb force F are tangential to the Sun, but radial forces to the proto-planets. The values of F and a are only mutually comparative and not absolute values. We multiply F with an unknown factor because the value of the distances D between the protuberances' parts are not known. The results for the initial acceleration a of the proto-planets' are multiplied with an unknown constant factor p as well.

I connect the condition for the direct proportionality of the accelerations with the orbit radii to the following: the physical-geometrical law (for low velocities, where v is the tangential velocity to the orbit)

$$v^2 = GM / r \tag{2.1}$$

must have been able to catch the planets into orbits, while they decelerated due to the increasing distance to the sun, and thanks to the bending path of the ejected proto-planets, caused by the sun's gravitation.

The more the proto-planets become distant to the Sun, the more the they also become distant to each other and the more their velocities loose their radial orientation towards the Sun and instead become tangential velocities by respect to the Sun. This means that a and r are directly proportional : $a \sim r$.

For the easy use of the calculations, I have put the figures of the electric charges of the proto-planets equal to the actual masses' data of the planets, multiplied with a constant factor $k = q_e /(m_p + m_n) \approx q_e /(2\, m_p)$.
The reasons are that it is probable that the hot cloud was almost totally ionised.

Interpretation of the acceleration's sign – *Retrograde orbits become prograde orbits.*

Indeed, the sign of the acceleration can initiate an prograde or a retrograde orbit about the sun. A negative (positive) sign for the acceleration will cause a prograde (retrograde) orbit, -or inversely-.
Even when the orbits initiate in retrograde way, these orbits will turn back into prograde orbits, as explained in *"A coherent dual vector field theory for gravitation"*. This *angular orbit-swivelling* is generated by any body, moving in the spinning gravitation field of the sun, and the conclusion was that the prograde-wise spinning sun will automatically generate prograde orbits of the planets. During this angular orbit-swivelling, the orbit's diameter remains unchanged, and the retrograde orbit turns towards a prograde orbit, more or less about a virtual axis, laying in the sun's equator plane.

The loss of angular momentum when a retrograde orbit swivels into a prograde one.

If a full prograde orbit is at 0° and consequently at the Sun's equator level, a retrograde orbit can be defined as an orbit between -90° and +90°. The full retrograde orbit is at 180° and this orbit will need the most energy to swivel into a full prograde orbit.
The energy for swivelling is provided by the Sun's gyrotation field, and there is no reason for an energy loss.

Definition of a statistical gauge for evaluating possible order sequences.

Table 2.2 is not resulting in accelerations that are directly proportional with the distances of the actual orbits of the planets. According table 2.2, the final order-sequence would then have become : Earth, Venus, Mercury, Mars, which is not correct.

When applying the statistically based equation

$$\sqrt{\sum_{i=1}^{4} (\boldsymbol{a}_i/\boldsymbol{r}_i)^2} \Bigg/ \sum_{i=1}^{4} |\boldsymbol{a}_i/\boldsymbol{r}_i| \tag{2.1}$$

we can compare the proto-planets' accelerations and the today's orbital radii. The results we can find using (2.1) will be situated between 0,5 (perfect fit) and 1 (worst fit). The statistical value of (2.1) is not defined here and we consider it only as an indicator and a standardisation method for the results.

If we want to transform the gradation from 0 (or 0% , worst fit) to 1 (or 100% , perfect fit) we need to use (2.2).

$$\boldsymbol{X} = \boldsymbol{2}\left(\boldsymbol{1} - \sqrt{\sum_{i=1}^{4} (\boldsymbol{a}_i/\boldsymbol{r}_i)^2} \Bigg/ \sum_{i=1}^{4} |\boldsymbol{a}_i/\boldsymbol{r}_i|\right) \tag{2.2}$$

In the case of table 2.2 we got a result of X = 0,91 or a 91% fit, which is reasonably good but not good enough to be a proof. Ideally, in order to get a real fit, we need to reach at least a fit of 97% , provided that there is only one solution between 97% ± 3%. In other words, we only can be sure of a final result if it is clearly superior to the rest of the group of possible solutions.

Since the hypothesis of table 2.2 wasn't correct, other alternatives should be tested.

Testing other sequence orders – *There is no best fit.*

There are two sequence orders that have results for X that are 0,96 or 0,97. These are the ones where the Earth and Venus are grouped together at the beginning or the end of the protuberance.

Indeed, the two mirror-solutions come to the same result. But that means that we didn't find any perfectly fit for the protuberance's sequence order of the core planets.

One could say that one of the reasons of that failure can be that the distance D is not a constant for the core planets. So, we could try all the combinations including many variations of the distance D. But will that augment the reliability of the result?

We will look at this phenomenon in the next chapter and analyse it.

3. The interpretation of the results.

Hypothesis: the distance D wasn't a constant – Proto-Venus and -Earth were closer.

This hypothesis is at least suspicious. Don't we risk to just try to find a solution by finding a value for D that fits without any physical ground? Moreover, if we would find a better result, would it be reliable when based on some iterating manipulation of figures? The answer is that we have no certitude anyway, even if we find a good fit.
I tried a number of possibilities where I made variate D between 0.8 D and 1.1 D but that mostly gave worse results. We got only one good fit : when the distance between the middle two proto-planets is reduced from D to 0,86 D , for the sequence order Mercury, Mars, Venus, Earth, we get a fit of X = 0,988 which is excellent.

	Proto planets	**M [kg] (xE24)**	**q [C]**	**F (N)**	**a [m/s²]**	**r (xE9)**	**a/r**
			mutually comparative figures only				
1	**Earth**	5,97	5,97	7,61	1,27	149,6	117,43
2	**Venus**	4,87	4,87	-6,1	-1,25	108,2	-86,45
3	**Mars**	0,64	0,64	-1,28	-2	227,9	-114,23
4	**Mercury**	0,33	0,33	-0,23	-0,69	57,9	-83,32
						***X* =**	**0,988**

Table 3.1: *result for the proto-core-planets with a distance between the middle two proto-planets that is reduced from D to 0,86 D . Proto-Mercury and -Venus have very similar values of a/r and Mars and the Earth as well.*

Remark that the mass of the Earth almost equals the sum of the three other planets. This is an interesting complement of evidence for the choice of the proto-planets' sequence order. From that point of view, the group of Venus + Mars + Mercury is balanced with the Earth. Moreover, Venus and the Earth are almost twins by size and by composition. Therefore, the proposed proto- sequence order seems to be the only reasonable one. Finally, the correct chemical composition of Mars is not well know, and most of the publications have extrapolated them according the actual sequence order [18].

The proto-planets Mercury, Venus and Mars have been projected in retrograde direction and the orbits have been swivelling towards prograde orbits in time. The Earth was projected in prograde direction. We analyse this case in more detail in the next chapter.

The exploded sunspot turned itself into a sequence of proto-planets – It exploded like an onion.

As we saw in my former paper "*Is the Earth a Former Solar Sunspot?*", I show that the sum of the gas planets' impulsion, seen as protons, have projected the same quantity of electrons into a sunspot which generated an equivalent quantity of core planets' impulsion. Both the gas planets and the core planets are strictly bound as two groups of four planets. The group of gas planets as generated by very hot protons and the group of core planets as generated by much colder electrons.

When looking from Mercury to the other planets, the proto-planets' sequence order begins with the most iron-contenting planets and ends with the planet having the most diversified number of atomic elements, the Earth. It probably exploded like an onion : in the middle, Mercury; around it, the first layer, Mars; then the second layer Venus and finally the last layer: the Earth.

The mystery of the sequence proto-planets, their spin rate and their tilt two by two.

In the table 3.1 , the proto-planets Mars and Earth show almost identical figures for a/r . The same is true for the proto-planets Mercury and Venus. What did they make grouping? No one can tell this for sure and we can only emit hypotheses.
Remarkable is also that two planet-groups have the same spin rates and tilts (the inverted tilt of Venus is considered equivalent because the spin is nearly zero).
Can all this be accidental, or is this mutually related? The probability for an accidental fit is 4!/(2!2!) or 16,7 %. I believe we should look at the more probable 83,3 %.

The global tilt of four of the eight planets is around 26°. The other planets are tilted near zero or a multiple of 90°. And the rotation time of two of the core planets is about 24 hours, whereas that of the gas planets is about 10 to 17 days.

One of the possible reasons of the very slow spin of Mercury and Venus could be that both proto-planets started to leave the solar protuberance under an angle with the magnetic path of that protuberance or under an angle with another magnetic path. This would result in an interaction between the ionized proto-planets and the magnetic path by a Lorentz force.
The Lorentz force, acting upon the circling ionized ring could have flipped the ring when it slid perpendicularly through the magnetic path. When the spinning ring has flipped by force, it has transformed its spin direction into the inverted direction. But by doing this, its original angular momentum has been totally consumed. The spin value is reduced to almost zero.

4. Discussion and conclusion.

One could be impressed by the excellent fit of the proto-planets sequence Earth, Venus, Mars, Mercury. However, when we look at the chemical content, the correspondence is logical. No other order sequence would better fit with the figures. It is very probable that the four core planets came out of a protuberance that was originated by the electrons. These electrons correspond to the mass of the core planets just as correspond the same quantity of protons with the mass of the gas planets.
The vanishing of the spin of Mercury and Venus could perfectly happen by the swivelling of the proto-planets when they slid over a solar magnetic path, with the result of a spin flip and a consumption of the spin. Mercury could have been re-flipped afterwards by a magnetic solar field, due to its high content of iron.
Based on the analysis of this paper, it seems obvious that the core planets are born out of a sunspot and its area, while the gas planets are created by an electromagnetic explosion out of the solar surface.

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Thierry De Mees

One day in 2004, I discovered the mainstream nebula theory which is supposed to explain the creation of our planets, and I was astonished. There were many suppositions needed that didn't even hold, to obtain the planets out of a nebula around the Sun.
Why couldn't the Sun itself, a gigantic reservoir of energy, not be at the origin of the planets?
When I investigated that possibility, I rapidly came to the concept of a solar explosion, and month after month I steadily found new evidence to support that hypothesis, without any other suppositions than that of the Huge Solar Protuberance.
Nothing followed so easily and logically out of my pen than the calculations and the evidence of this new paradigm.

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