A Unified Theoretical Framework Bridging Quantum Mechanics and Planetary Dynamics

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Abstract
Quantum mechanics and planetary motion have traditionally been treated as separate domains governed by distinct principles. However, recent theoretical developments suggest a deeper connection between atomic-scale diffraction phenomena and large-scale gravitational interactions. In this work, a unifying theoretical framework is proposed, deriving planetary formation and motion from fundamental quantum diffraction principles. By reinterpreting classical orbital mechanics through a diffraction-based Hamiltonian, a natural continuity is established between the quantized behavior of atomic systems and the macroscopic dynamics of celestial bodies. The model challenges the conventional role of gravity in mass accumulation and planetary formation, suggesting that diffraction principles may play a fundamental role in structuring both atomic and planetary systems. This approach provides new perspectives on fundamental forces and opens pathways for experimental validation across multiple scales. Such an interpretation profoundly reshapes both frameworks and redefines the role of electrodynamical forces in the universe.

Introduction

Quantum mechanics and planetary motion have traditionally been considered distinct fields governed by separate principles. Quantum mechanics describes microscopic systems through probabilistic wavefunctions and particle-wave duality [1, 2], while planetary motion has been modelled by classical mechanics and general relativity, which attribute large-scale gravitational interactions to space-time curvature [3, 4].

This work proposes a new theoretical framework, challenging the necessity of gravity as the primary force in planetary formation based on findings [5] that show how planetary rotational and translational speeds, as well as dimensions, emerge from density functions obtained via micrometeoritic scattering onto cosmic structures such as the Main Asteroid Belt (MAB) and the Kuiper Belt [5]. These results suggest that planetary formation may not be primarily governed by gravitational dynamics as described by General Relativity and the constant ***G***, but instead by interference-driven modulations. This framework offers a precise description of planetary characteristics such as mass distribution, orbital radii, and angular momentum.

In traditional gravitational models, the gravitational constant **G** has been used to explain cosmic dynamics, leading to the introduction of hypothetical constructs such as dark matter to account for discrepancies observed in galactic rotation curves [6,7]. However, dark matter is not the only discrepancy suggesting limitations in attributing gravitational effects solely to visible or baryonic mass. Recent studies have highlighted another fundamental inconsistency known as the **Hubble tension**, where local measurements of the universe's expansion rate differ significantly from those inferred from the early universe via the Cosmic Microwave Background. This tension challenges the assumption of a uniform expansion rate as predicted by the standard ΛCDM model and has prompted alternative explanations beyond traditional gravity-based frameworks [8,9]. However, this work proposes that electrodynamical interactions, responsible for atomic stability, also regulate planetary behaviour, unifying atomic and planetary mechanics through a diffraction-based Hamiltonian applicable across scales. This new perspective suggests that electromagnetic forces and diffraction effects, typically associated with quantum systems, govern both atomic and planetary behavior. It challenges the validity of black holes, gravitational waves, and dark matter as they are currently understood, opening new avenues for experimental validation and fundamentally reassessing the forces shaping celestial systems.

3. **Theoretical Framework/Model**

The new model proposes a unification between planetary and atomic systems, suggesting that planetary masses exhibit quantized behaviour in accordance with the principles of diffraction and interference. These principles, which govern both atomic and planetary domains, offer a new perspective on the fundamental forces of nature. Diffraction and interference phenomena emerge from the interaction of matter with radiation—both electromagnetic and particulate—influenced by their charged nature. These interactions lead to wave-like behavior due to the coupling between electric and magnetic fields. This behaviour, which can manifest on both macroscopic scales (e.g., micrometeoritic particles and planetary systems) and at smaller scales (e.g., atomic systems), indicates that the same underlying principles govern both atomic and planetary dynamics.

3. 1 **The Diffraction Hamiltonian**

The model is based on the assumption that all matter, from atoms and molecules to larger structures like planets, is composed of charged systems.

Quantisation is the result of matter being constituted essentially by charges whose Neutrality requires to satisfy a stationary equilibrium intendent as follows:

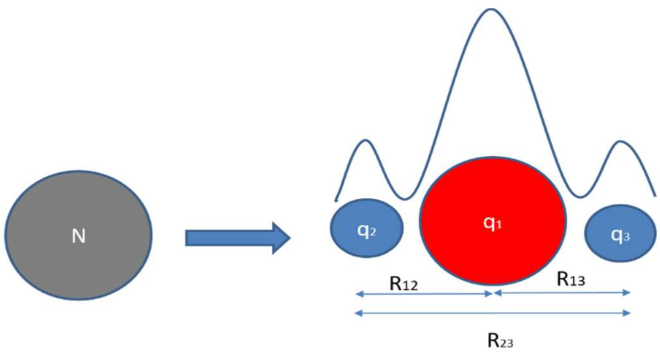


Figure 1: The simplest neutral object , the Neutron, undergoes the separation of three particles that obey the laws of diffraction, with the positive charge placed in the central major mass and the negative charges in the peripheral minor masses undergoing beta decay.

The graph illustrates how the simplest neutral object, Neutron undergoes diffraction and interference laws, resulting in quantized masses separation according to the intrinsic nature of the universe, which tends to separate into one positive and two negative charges.

Naturally, it can be observed that each charged particle is subject to both attractive and repulsive forces as the most stable condition is still a Neutral. According to Coulomb's law, the potential energy of the newly formed system is given by

$$V(r) = k\frac{q_1 q_2}{R_{12}} + k\frac{q_1 q_3}{R_{13}} + k\frac{q_2 q_3}{R_{23}} \qquad (1)$$

Since nature always strives to minimize energy, the best configuration for equal charge sharing is determined by the stationary state. In this state, we have $q_2=q_3$ and $R_{12}=R_{13}$ therefore $R_{23}=2R_{12}$. Rewriting the potential, we obtain the following relation:

$$V(r) = k\left(-\frac{q_1 q_2}{R_{12}} - \frac{q_1 q_2}{R_{12}} + \frac{q_2 q_2}{2R_{12}}\right) \qquad (2)$$

Then the system is at rest or in equilibrium, if $V(r)=0$. In this case no net force can be observed and it can be found that:

$$\frac{2q_1 q_2}{R_{12}}k = k\frac{{q_2}^2}{2R_{12}} \qquad (3)$$

it follows:

$$\frac{q_1}{q_2} = \frac{1}{4} \qquad (4)$$

Even if this were the most stable configuration following charge separation, it would not achieve charge neutrality, which in nature is instead realized when the external charges q_2 and q_3 each equal half the magnitude of the central charge q_1.

The overall implication of this discussion is that the attractive potential between the central charge and the external ones should follow the form $V(R_{12}) = -k\frac{{q_1}^2}{4R_{12}}$ in order to reach static equilibrium. However, this condition is not satisfied in reality, and thus the system cannot be considered at rest, since neutrality is attained only when$q_2 = q_3 = 0.5q_1$. The kinetic energy acquired by the lighter masses, which carry opposite charges equal to half the magnitude of the central nucleus, contributes to a diffraction Hamiltonian of a single particle (5). This Hamiltonian reflects the necessity of maintaining stationary equilibrium, as dictated by the charge neutrality of the system.

As a result, the overall configuration reveals a new form of equilibrium—one that implies the Universe inherently favours dynamic motion that evokes static conditions, rather than rigid, material stasis:

$$E_{tot}\,(q_2) = EK_2 + V(R_{12}) = -k\frac{{q_1}^2}{4R_{12}} \qquad (5)$$

In other words, in order to be still in a stationary equilibrium not balancing the proper charge (4) the system needs to move at specific kinetic energy according to the mass $m_2 = m_3$ so that the centripetal force reproduces a reduction of the overall charge q_2 so to satisfy the initial relation which leads to (5'):

$$\mathrm{Etot}\,(m_2, q_2) = 1/2 m_2 v^2 - k\frac{{q_1}^2}{2R_{12}} = -k\frac{{q_1}^2}{4R_{12}} \qquad (5')$$

Such condition determines a quantisation since it forces the natural speed of a charged mass to hold a specific kinetic energy to reproduce a stationary equilibrium being Neutrality the real starting point of the system as suggested by Figure 1. This turn into a quantised kinetic energy associated to the charged system since:

$$\frac{1}{2}m_2v^2 = k\frac{{q_1}^2}{4R_{12}} \qquad (6)$$

By introducing the kinetic energy and considering the total energy of the system, it can be written the Diffraction Hamiltonian for the overall system:

$$E_{tot}=E_{Kin}+V(r)=0 \qquad (7)$$

When in the ideal case where mass separation is perfectly identical like for the three body system shown in Figure 1 results in:

$$2EK - 2k\frac{q_1^2}{2R_{12}} + k\frac{q_1^2}{2R_{12}} = 0 \qquad (8)$$

Having found for each particle that the basic EK can be associated to a repulsive force as in (6) and substituting in (8) it can be obtained:

$$\frac{k}{2}\frac{{q_1}^2}{R_{12}} - 2k\frac{q_1^2}{2R_{12}} + k\frac{q_1^2}{2R_{12}} = 0 \qquad (9)$$

$$\frac{k}{2}\frac{{q_1}^2}{R_{12}} - k\frac{q_1^2}{R_{12}} + k\frac{q_1^2}{2R_{12}} = 0 \qquad (9')$$

Which holds for any integer n reducing of a quantised amount the initial peripheral charges $q_2=q_3$:

$$\frac{k}{2n}\frac{{q_1}^2}{R_{12}} - k\frac{q_1^2}{nR_{12}} + k\frac{q_1^2}{2nR_{12}} = 0 \qquad (9'')$$

Which lead to the diffraction Hamiltonian where the mobile charges can have any of the kinetic energies reproducing the stationary state as if (4) was valid:

$$EK_n = \frac{k}{4}\frac{{q_1}^2}{nR_{12}} \qquad (10)$$

So these are the accessible kinetic energies that would stand for the system to be in a reasonably stationary state and the fundamental state is for n=1. Then the classical diffraction system would have quantised positions as shown by the $Sinc^2(R)$ function below, while the Sinc(R) function describes the wave vector influencing the charged particles in different regions of space according to the potential exerted by the attraction of the positive nucleus.

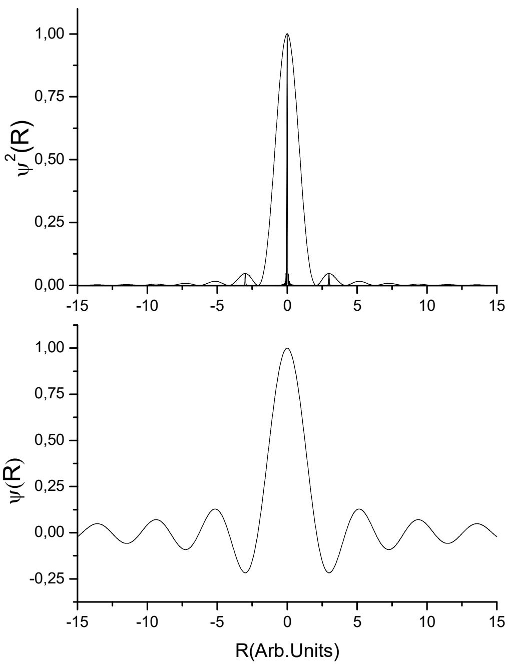
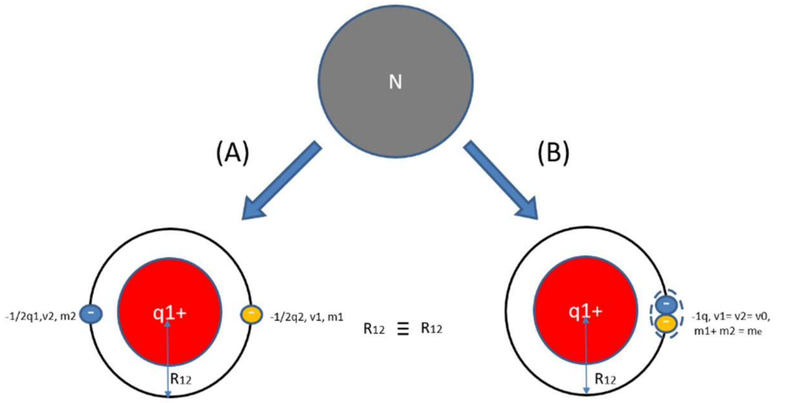


Figure2: The typical diffraction-interference mechanism generating charge separation, as governed by the Diffraction Hamiltonian, is schematically represented by the sinc (r) and $sinc^2(r)$ functions.

I will assume that this applies both to atoms and planets and that the reasoning behind their motion is due to electrostatic attraction in both the atomic and planetary domains. Consequently, both systems behave in the same way to achieve a stationary condition.
In the ideal case, the kinetic energy of a charged particle within a natural system—whether atomic or planetary—must satisfy the fundamental observation that it originates from a neutral entity which, upon activation, splits into three constituent particles. This tripartite division, driven by the intrinsic nature of the Universe, ensures that the resulting kinetic energies achieve equilibrium, as described in Equation (10), analogous to the simplest case of the neutron undergoing beta decay. In the fundamental state (n=1), the system occupies the region allowed by the wave function, as illustrated in Figure 1A. According to this description, the resulting particles are contained within spherical structures, just as planetary distributions provide a three-dimensional reproduction of the diffraction process generating charges. However, their positions cannot be arbitrary, as they would be in a neutral free-space condition. Instead, the quantized objects will have a radial distance that aligns with the charge of the system.

I will assume that the origin of charge is within the Neutron and that it is here that the charges have the origin in the diffractive Hamiltonian condition generating three charges as in the following scheme:



$$E_{Kin} = +k\frac{q_1^2}{2R_{12}}$$

Figure 3: Explains the occurrence of the beta decay process based solely on the diffraction Hamiltonian, governed by the interaction of charged particles. In Case A, the ideal process is shown, where the separated particles share the same energy and remain permanently separated from each other. In Case B, the possible real process is depicted, where spin effects cause the charged particles to collide and fuse, resulting in a definite charged system

In such an idealized situation, I will consider that half of the charges produced through the splitting process occurring inside the Neutron are actual spherical particles—rather than clouds, as traditionally described by classical wave mechanics for microscopic charges (A). Each of these particles must individually satisfy the stationary condition defined by Equation (10), such that, in the stationary state, each will yield:

$$\frac{1}{2}m_{1,2}v^2 = k\frac{{q_1}^2}{4R_{12}} \qquad (11)$$

In the case of the neutron, the ideal scenario is replaced by a slight differentiation that leads to beta decay after approximately 14 minutes and proposed by scheme (B). This decay results from the fusion of the split components into the electron's final configuration. The resulting system acquires the kinetic energy necessary to establish a stationary state, as described by Equation (7). This process is illustrated in Figure 3 reported in (12):

$$2\left(\frac{1}{2}m_{1,2}v^2\right) = \left(\frac{1}{2}(2m_{1,2})v^2\right) = \frac{1}{2}m_e v^2 = k\frac{{q_1}^2}{2R_{12}} \qquad (12)$$

As critically observed in phases A and B, it is evident that the origin of charged particles occurs within the Neutron and enables the fusion of external charges. Since their paths are identical, this leads to a final mass of $2m_{1,2}$, as shown in (B), with twice the charge of each individual element produced in the initial diffraction system of (A), apart from the neutrino emission—which I will assume does not appreciably influence the final mass of the system. In this condition, a "stationary orbit" can still be obtained, as the resulting final particle of mass m_e remains in the same orbit as the two half-systems constituting it. This leads to the possible equivalence experimented in the first stable atom the Hydrogen atom:

$$hv = k\frac{{q_1}^2}{2R_{12}} \qquad (13)$$

This relation establishes that the kinetic energy of a charged particle in a stable orbit—such as that of an electron around a proton—can be associated with the sinusoidal movement of the electric and magnetic field of a photon with specific energy *hv*. If nuclear stability, maintained by the spinning charge system, can be replaced by "feeding" the same amount of energy via a photon, then the system can be ionized. For the hydrogen atom, the ionization energy is known to be =13.59eV. Given charge $q_1=1.6x10^{-19}$ C and $k = 8.99 \times 10^{9}\ N \cdot m^{2}/C^{2}$, R_{12} can be calculated as the Bohr Radius, 0.529Å. This calculation leads to the conclusion that diffraction principles are intrinsic to atomic nature due to the charged properties of its components and do not require the Hamiltonian formulation that arises from treating the electron as a wave cloud around the nucleus. Instead, quantisation emerges from the interaction of photons with these intrinsic properties, producing stationary orbits that satisfy diffraction conditions. In this framework, beyond n=7–8, the electron can be considered nearly free. This implies that at approximately $7a_0$ (about 3.5 Å), the electron is effectively unbound. In contrast, classical quantum mechanics relates the orbital radius to n^2, yielding $49a_0$ (about 25 Å) for n=7 a much larger distance for the electron to be considered free from the nucleus.

Form this description of the atom then it comes out that the solution of the Hamiltonian Ψ(r) still holds the characteristics of the energy needed to perform quantised jumps among the allowed stationary states as shown in Figure 3.

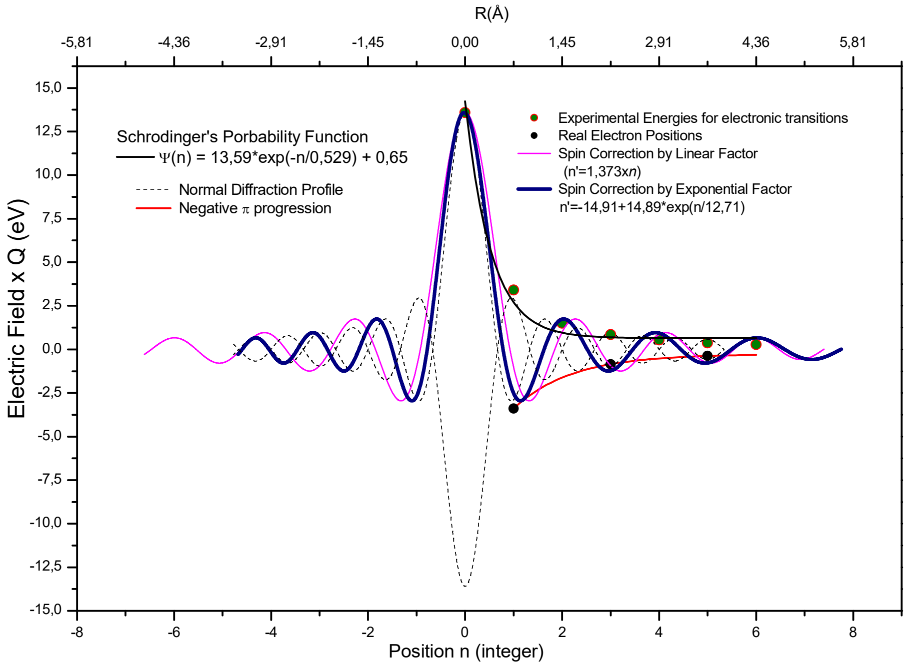


Figure3 The Figure reports the *Ψ(r)* of the Hydrogen atom, representing the decay into space of the Electric field of the proton, in the present Diffraction-Interference model (—). Next to it is reported the Normal Diffraction profile related to the Sinc(r) function (……). The Green dots express the Experimental Energies obtained by spectroscopic methods. The black dots represent the real maxima of probability density of finding the charged particle, indicated by the principal quantum number n. The Spin corrections of the Normal Diffraction profile is reported assigning to the Ψ(r) the best fitting positions between positions and energies considering the asymmetric progression, linear (—) and exponential (—). In the top layer is reported the possible orbital distances as the increasing principal quantum number n produces a new orbital stability distance.

Nevertheless, the characteristics of the system are significantly altered when considering their physical implications. In this model, the true density function governing the electron around the nucleus—assumed here to be a proton—is described by a **Sinc(r)** function. This arises naturally from the standard diffraction profile and reflects the interaction between the electric field of the incoming photons and that generated by the orbiting charge. This interplay gives rise to distinct spatial regions where stable electron orbits can exist, orthogonal to the natural motion of the charged particle. This condition results from the fact that the electric field of the photon is orthogonal to its direction of motion, whereas in the case of the charged particle, the electric field lies in the plane of rotation.

According to this description the electron's radius is represented by the y (r) function when perturbed by incoming radiation varies according to a Conical Logarithmic Spiral which has the property to have $R(\varphi) = R_0 \cdot exp(-k\varphi)$.

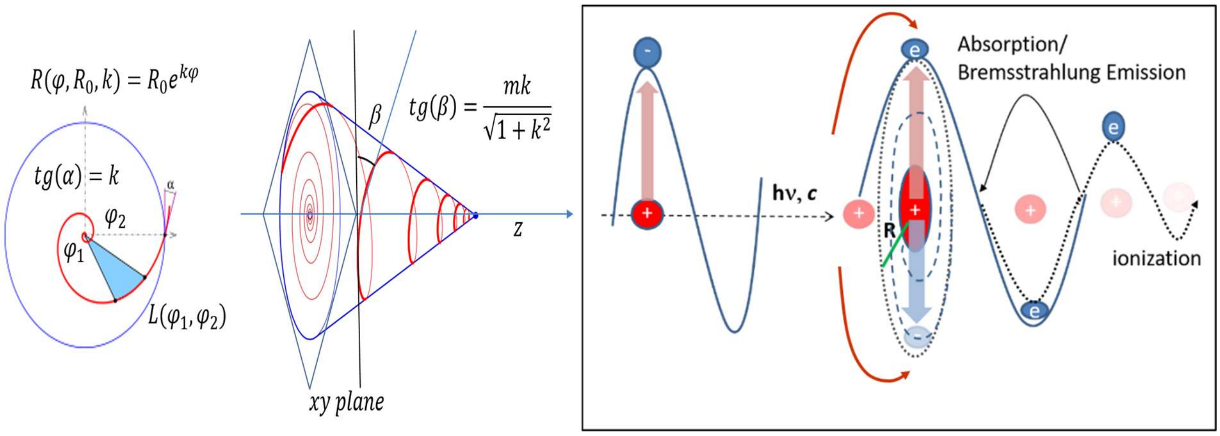


Figure 4 A logarithmic spiral describing the possible process of the absorption of the photon collapsing into the nucleus in the *xy* plane projection, while the electron conically spirals away from the stable circular orbit (blue circle). Having considered *m,* the slope of the cone, related to the number of turns which are needed to be from the nuclear potential. Then I have supposed that for the hydrogen atom *m* is around 14. Then I found the path length run by the electron established by the slope of the cone as shown.

By contrast to the classical solution of the Schrödinger equation here represents the exponentially decaying function, which stands for the diminishing potential field acting on the bound electron. In **Figure 3-4**, this is illustrated by the exponential decay function, highlighting the difference between the classical quantum approach and the diffraction-based interpretation proposed here.

$$E(n) = 13.59\, e^{(-n/0.529)} + 0.65\ eV \qquad (14)$$

n being the principal quantum number and the +0.65eV would be a general standing energy of the universe that relates to the possibility of trapping an electron by any vibrational mode of the surrounding universe. Equation (14) represents the various energies required for the jumps in the quantised portion of space indicating the special orbits giving the stable stationary orbits and the most general case of equation 15 which defines the ionisation energy:

$$h\nu_n \sim k \frac{{q_1}^2}{2nR_{12}} \qquad (15)$$

The proposed relation has also been extended to include the **spin of the system**, since the purely ideal case does not account for the spin of the nucleus or the orbiting charges. Nevertheless, real systems do exhibit such elements, which must be considered. As a result, a **linear and exponential dilation** of the n^{th} orbital has been introduced.

This is the result of quantizing the energies of photons being absorbed, which are related to the "stationary orbits" available to the system. The interaction of the photons corresponds to the appropriate energy of the moving electrons inside the atom, as *hν* can be associated with the kinetic energy by equation (16):

$$EK_n \sim k \frac{{q_1}^2}{2nR_{12}} \qquad (16)$$

A similar configuration can be observed in planetary systems. In the specific case of our Solar System, it can be seen that the **positions of the planets** follow the **diffraction well** generated by multiple scattering events occurring within the **Main Asteroid Belt (MAB)**, which begins to define the structural configuration of the system. In this case the factor 2 can be related to having in an ideal case to system like in the following relation (17):

$$2\left(\frac{1}{2}m_p v^2\right) = k\frac{{q_1}^2}{nR_{12}} \qquad (17)$$

This condition clearly states that for each stable kinetic energy it can be associated two masses m_p having quantised orbits n R_{12}.

Referring specifically to the case of the Telluric planets and separating the right and left portions of the Diffraction System as proposed by G.Alberti [5] having found that n = 0, 1, 2, 3 as the only possible orbits and having an average R_1=0.5AU, then it comes quite spontaneous that without considering spin effects the system would give stable orbits of R_2=1AU and R_3=1.5AU which are quite coherent orbits found for Earth and Mars. On the other hand, the left portion of the Diffraction produces an exponential contraction giving rise to a possible R_{-1}=-0.36AU that would lead to R_{-2}=-0.72AU and R_{-3}=-1.08AU which finds the only experimental agreement with Venus but it also confirms the possible overlap between Moon's orbit with that of the Earth that considering the exponential contraction produces R_2=1AU and R_{-3}=1.04AU which still gives proper conditions form mutual attraction [5].

In a most general case it can be proposed then that the kinetic energy of the planets just like for the electrons is determined by the *Diffraction Hamiltonian* that is related to the charge Q_p being present on the Planetary system and by the charge present on the Sun Q_s being one the opposite of the other.

$$\frac{1}{2}m_p v^2 = K\frac{q_p Q_S}{2R_p} \qquad \text{where K=k/2} \qquad (18)$$

Or

$$v^2 = \frac{\Gamma}{R_p} \qquad \text{where } \Gamma = K\frac{q_p Q_S}{2m_p} \qquad (18')$$

Supposing that the ratio q_p/m_p scales constantly throughout space as shown by the book (Star Winds) and [5].

According to this model, the square of a planet's speed is inversely proportional to its radial distance from the Sun as confirmed by the Γ value extracted by the Fit of the measured data in the graph below belonging to the right portion of the PFP as proposed by the publication on Zenodo [5]:

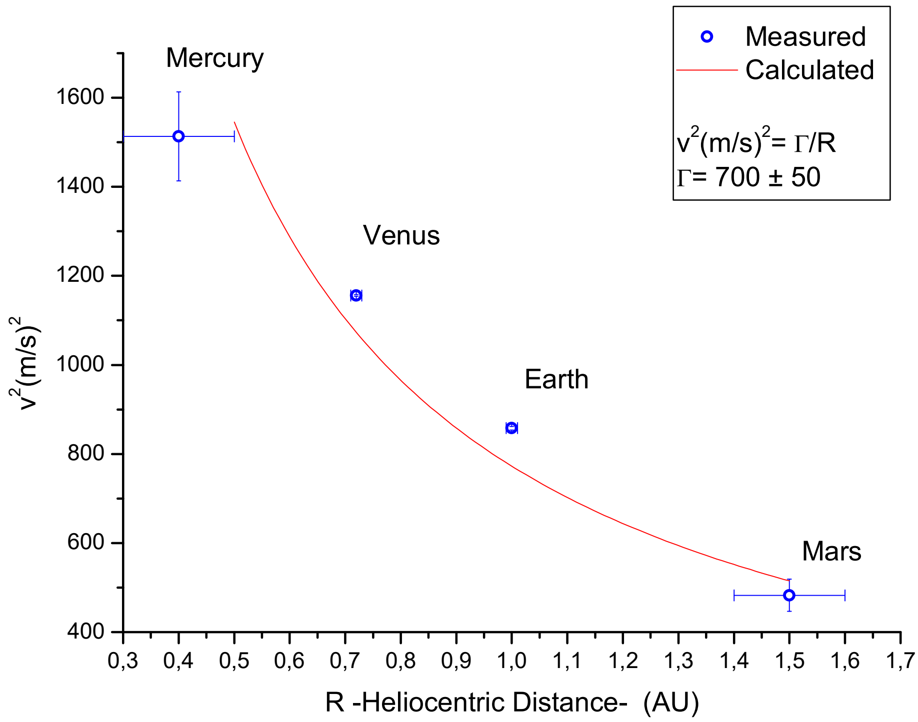


Figure 5: The inverse radial dependence of the squared speeds — measured values (blue dots with error bars) and calculated results (red continuous curve).

The kinetic energy proposed by equation (18) suggests that this condition is suitable for achieving stationary equilibrium. From this view and assessing at least in the Tailor approximation conditions around n=0,±1, two masses, m_p, can be identified, each having similar orbits and a distance R_p from the central Star of the planetary system.
This being the case for Mercury and planet Caloris X identified as the missing resonance in the published article Zenodo [5]:

$$2EK_{single} = EK_{couple} \qquad (19)$$

This suggests that if a planet was lost due to **collisional expulsion effects**, and the overall orbital system remained unchanged, then all the residual energy would need to be conserved and **transferred to the remaining planet** on that orbit — in this case, **Mercury**.
So EK_{Single} turns out to be the new expected kinetic energy of the system when its radial distance remains unaltered hence its new speed will be following:

$$v_{single} = \pm\sqrt{2}v_{couple} \qquad (20)$$

On the other hand, the radial distance can be affected if the speed of the remaining planet stays the same of that of the couple of diffracted systems at the origin. Then by writing eq. (19) in terms of the initial ($L_{p}i$)and final ($L_{p}f$) Angular momentum, for the system being "ionised", in the conditions of conservation of energy and momentum, I can write:

$$\frac{L_p^2 f}{2M_p} = \frac{2L_p^2 i}{2M_p} \qquad (21)$$

and expressing eq.18.5 in an extended way I obtain:

$$M_p v_f^2 R_f^2 = 2M_p v_i^2 R_i^2 \qquad (22)$$

If we assess that the speed of the system remains unaltered and the only thing that changes is the radial distance, it can be written that $v_i=v_f$ so:

$$R_f^2 = 2R_i^2 \qquad (23)$$

Hence:

$$R_f = \pm\sqrt{2}R_i \qquad (24)$$

So a system that has suffered an elastic collision which results in an ejection of one of the components of the parent diffractive couple of charged orbiting systems, results in a new stable condition that may oscillate in its speed between:

$$v_{i=Aphelion} \leq v \leq v_{f=periheli} \quad = \sqrt{2}v_i \qquad (25)$$

And its radial distance from the Central Star:

$$R_{i=Perihelion} \leq R \leq R_{f=Aphelion} = \sqrt{2}R_i \qquad (26)$$

In between these extreme values of speed and radial distances all those combinations that satisfy eq.(19) can be found.
The test bench of these model, concerning dynamical properties of planets, would be to observe the accordance of the $R_{i/f}$ and $v_{i/f}$ parameters for planet Mercury. Indeed, the innermost planet of our solar system, according to this treatment, has certainly suffered a collision where the parent diffracted planet, Caloris-X, has been ejected from its trajectory, certainly favoured by their proximity in orbital trajectories.

Mercury	**Speed (Km/s)**[10]	**Radius (A.U.)** [10]	**Calc. Radius (A.U)**	**Calc. Speed (Km/s)**
Perihelion	58.98	0.313	0.33±0.06	56.0
Aphelion	38.86	0.459	0.467±0.06	39.6

Table.1: The table reports Mercury's measured dynamic properties reported from NASA[7] compared with the extracted values calculated in this present work. Here the Calculated radius comes from the Asymmetric diffraction profile extracted from the 2.9 Kirkwood gap scattering equation published on Zenodo [5]. While the calculated speed comes from the Γ' parameter reported in Figure 5.

The agreement between the observed and calculated radial distances is approximately 95%, which is about the same as the match between the calculated and observed orbital velocities. This strong consistency with the proposed diffraction-based Hamiltonian supports the idea that planetary attraction may result from Coulomb-like forces, rather than the gravitational conditions traditionally described by the Universal Law of Gravitation.

Conclusions

The observations derived from the diffraction Hamiltonian confirms that the diffraction mechanism originates from the interaction between the electric field of the photon and that of matter. This supports the perspective that Coulomb interactions—rather than classical gravitational forces—govern the spatial organization of matter across scales. Although spin-related effects have not yet been incorporated, future studies will investigate their influence on the distribution of charged matter in both atomic systems, such as the hydrogen atom, and in planetary structures.

The findings suggest that the hydrogen atom forms through the orbital arrangement of particles produced during neutron fusion processes. Traditional models, including the Bohr relation $a_0 n^2$ and standard quantum mechanical approaches based on the classical Hamiltonian, predict atomic dimensions extending up to 75 Å (with n=14n = 14n=14 or higher for hydrogen). However, these predictions do not align with experimental observations. In contrast, the diffraction-based Hamiltonian indicates that the electron becomes effectively free at distances between 3.5 and 4 Å from the nucleus. This model implies that photon-induced interactions cause the electron to spiral along quantized orbital paths, beyond which it escapes the atomic potential well.

At the planetary scale, the mass distribution among planets appears to follow a configuration that ensures a stable equilibrium, consistent with the principles of diffraction. This pattern is attributed to the interaction of cosmic winds and the existing asteroid belts, which scatter and activate fundamental charges during high-energy collisions—conditions analogous to atomic-scale diffraction processes driven by electric field vectors. The resulting structure fulfills the requirement for minimum-energy stationary states, as predicted by the diffraction Hamiltonian, while maintaining global charge neutrality—an essential condition for systemic stability.

Within this framework, atomic and planetary systems exhibit analogous behavior: electric charge is the fundamental force responsible for cohesion. In this model, the central core (e.g., the Sun) carries a net positive charge, while the orbiting bodies—the planets—carry net negative charges. This conclusion is further supported by the observed presence of negatively charged regions in the Van Allen radiation belts surrounding Earth and major planets like Jupiter and Saturn. In planets lacking such belts, negative charges are often found closer to the surface or in suspended particulate plumes, as observed on the Moon and within the Main Asteroid Belt. This perspective introduces a paradigm in which Coulomb attraction, rather than gravity, acts as the dominant binding force in planetary systems—mirroring the structure and dynamics of atomic systems.

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