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THEORY OF DYNAMIC INTERACTIONS

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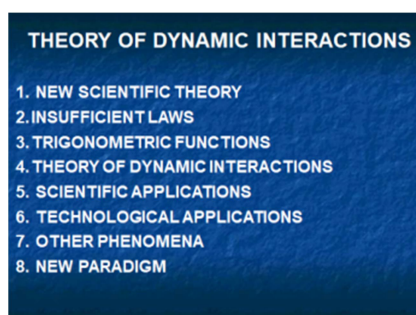
Gabriel Barceló

Ladies and Gentlemen:

In the last forty years, I have been spinning my mind with a big-bang of conjecture and dynamic aporias.

The topic of my talk is a new THEORY OF DYNAMIC INTERACTIONS, in my opinion, particularly relevant to all of us who are deeply in love with science, and also for those who are ready to open their minds.

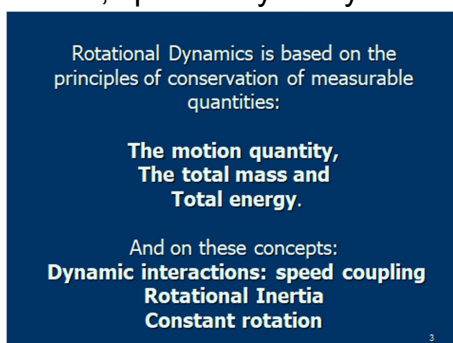
Our new investigation analyzes the behavior of bodies with accelerations, and proposes new keys to better understand the mechanics of the universe, and to have a more real scientific cosmology.



Applying the Field Theory to the dynamic magnitudes circumscribed to a body, the research has achieved a new conception of the coupling of these magnitudes, and the behavior of solid rigid bodies subjected to multiple simultaneous non-coaxial rotations.

The results of the investigation allows us to justify characteristics of the behavior of the celestial bodies, not envisaged in other models, such as the dynamic equilibrium of the universe, that the celestial systems are flat or the rings of Saturn.

Our research proposes, on the other hand, a different celestial mechanics, which is complementary to classical mechanics, specifically for systems accelerated by rotations.



These new concepts illuminate the Theory of Dynamic Interactions [1], a new model for non-inertial systems with axial symmetry. The model is based on the principles of conservation of measurable magnitudes: the notion of quantity, total mass and total energy. And on these concepts: Dynamic interactions: speed coupling, Rotational Inertia, and Constant rotation.

1. New scientific theory

The Cosmos is not, necessarily, in an unlimited expansion but, at least, its elements constantly rotate, in a stable and harmonious equilibrium, according to this new scientific theory that proposes new keys to better understand the mechanics of the universe and to grasp a more real cosmology.

The research analyzes the behavior of bodies with accelerations to better understand why we live in a world of nights and mornings, with twilights and sunrises. Its starting point is a new physical correlation between the orbiting of bodies and the movements of intrinsic rotation.

This correlation has given us a mathematical expression, and we have experimentally verified its accuracy throughout this investigation. After the experimental tests, we have come to the conclusion that new general laws of behavior can be deduced, based on the analysis of the dynamic fields created.

2. Insufficient laws

The investigation starts from the basis that the laws of dynamics currently accepted are insufficient to determine the behavior of the bodies that rotate. We have investigated inertial and non-inertial systems to better understand the response of rigid bodies simultaneously subjected to non-coaxial rotations.

The research enters the subject of Field Theory, which describes the set of mathematical principles and techniques that allow studying the dynamics and spatial distribution of physical fields, and proposes new hypotheses to explain the dynamic behavior of the systems that are subject to non-coaxial accelerations.

Applying the Field Theory to the dynamic magnitudes circumscribed to a body, we have achieved a new conception of the coupling of these magnitudes, and the behavior of solid rigid bodies subjected to multiple simultaneous non-coaxial rotations.

The results of the investigation are coherent with Einstein's theories on rotation; although they warn that the Theory of Relativity is born from a translational linear thought, to which later rotational concepts are added. We suggest, therefore, a revision of this rational development.

The research does not challenge Newton's laws for inertial systems, since a conceptual structure of proven reliability has been developed with them.

Our discrepancy arises in the interpretation of the coupling of non-coaxial rotations, in non-inertial systems. Based on this divergence, we propose a distinct and complementary

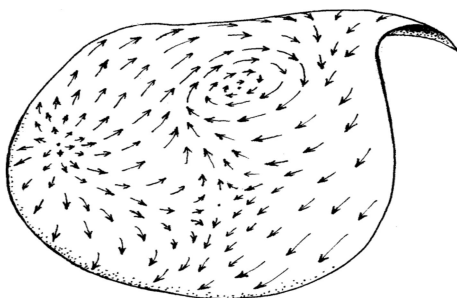
mechanics, different from classical mechanics, specifically for non-inertial systems accelerated by rotations.

3. Trigonometric functions

This research has discovered that, at the moment in which a new non-coaxial rotation occurs on a celestial body that already has intrinsic rotation, both the velocity and the acceleration of each particle of the body are trigonometric functions, albeit of a different nature: when one grows because it is sinusoidal, the other decreases because it is cosenoidal, and when one is canceled, the other reaches its maximum value.

This instantaneous variation creates an inhomogeneous distribution of acceleration, that is what motivates the appearance of effective inertial forces, which manifest as dynamic **moment of interaction**. This is a concept that transcends the classic *gyroscopic moment*, to incorporate this notion into the conceptual structure of a new coherent rotational dynamics.

This new coherent rotational dynamics is formulated mathematically, and it develops a qualitative model to store and structure the mechanical knowledge of the rigid solid and Celestial Mechanics, and also suggests new rotational and dynamic concepts, that mark the difference, in mechanics, between the dynamics of inertial systems, and the dynamics of accelerated systems not inertial.

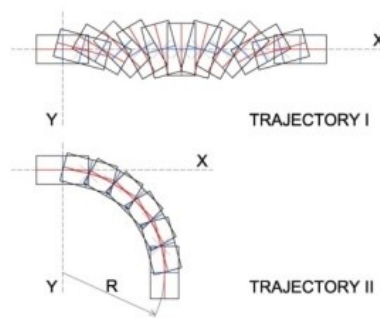


Example of a geometric interpretation of a field of vector dynamic magnitudes generated at each particle of the mobile. [2]

An imaginary field of vectors representing an assumed dynamic magnitude, for example the velocity of translation of a body, in each of his points, is illustrated in figure.

It is necessary to emphasize that the velocity fields that are the object of our analysis will be at each particle of the mobile studied, and represent that specific magnitude in each point of the celestial body. If the mobile is subjected to a simple translation, without any rotation, the field will be uniform and isotropic, and all vectors representing the magnitude of that field will be equal and parallel.

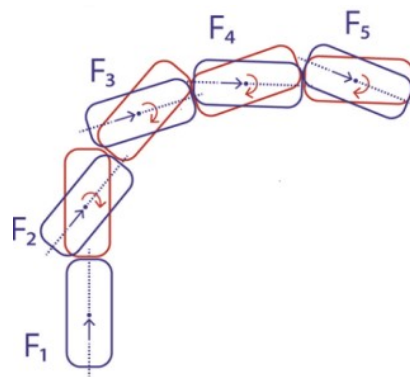
On the other hand, an external torque or moment creates a new field of velocities, at each particle of the mobile. This field will be anisotropic, if the body already has another non-coaxial rotation, because the velocity of each point will depend on its geometric position in the rotating body.



Trajectory I predicted by classical mechanics, and trajectory II deduced by means of the Theory of Dynamic Interactions. We have observed and confirmed the second case repeatedly with experimental tests. [3]

If a new torque acts on an axis that is spatially non-concurrent with the existing rotation, the body will react by modifying its path, adding a precession or orbital movement in space to the initial rotation, as if it seemed to be subject to a central force.

We claim that the body, instead of taking a linear path, as would be expected from the Newton-Euler equations in classical mechanics (Trajectory I in figure), will take a curved path, as we have repeatedly said that we observed in our experimental tests, on account of the coupling of the resultant velocity fields on each point of the body (Trajectory II in figure).



Trajectory of a body equipped with translational speed and intrinsic rotation on its principal axis of inertia, when it is subjected to a new non-coaxial moment with the intrinsic rotation. [4]

Our dynamic differential hypothesis is that the velocity field of the initial rotation is kept constant, but instead the field of translational velocities couples with the field of translation velocities generated by the second, non-coaxial rotation.

In this way, the body changes its trajectory, describing a new orbit, if the external action remains constant.

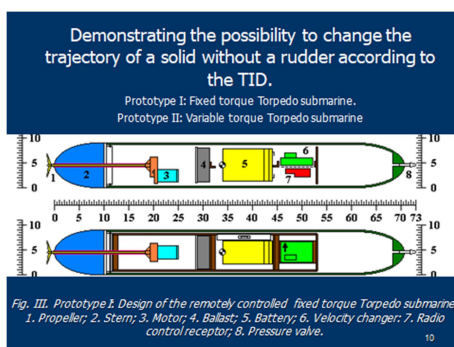
The conclusion of our proposed theory is that for this assumption, the mobile, will gradually change its trajectory, as shown in Figure.

As it is seen in figure, we can assume a body with rectilinear trajectory, equipped with translational velocity and intrinsic rotation on its principal axis of inertia, which is subjected to a new non-coaxial moment with the intrinsic rotation, for example in the figure, a flotation / weight torque, contained in the drawing plane, as in ours experiments.

In such case, the anisotropic velocity field, generated by this flotation / weight torque, forces the mobile to rotate about a vertical axis, perpendicular to that of the external torque acting on it (See figure). In red is the displaced mobile, but with the previous orientation, and in blue, the new orientation of the mobile, due to the dynamic coupling taking place. The result is the coupling of both the translational and the anisotropic fields and, consequently, the change in the mobile trajectory, describing an orbit, if its initial velocity was constant. This orbit will be closed if the external torque remains constant over time.

4 Theory of Dynamic Interactions

These new concepts illuminate the **Theory of Dynamic Interactions**, a new model for non-inertial systems with axial symmetry. We perform multiple experimental tests.



Design of the remotely controlled prototype I submarine (by Manuel Benavente 4 [5]).

4.1 Final tests: Prototype I

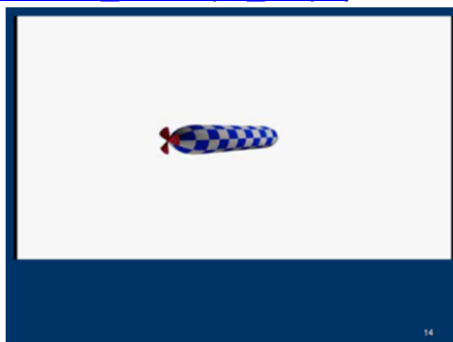
In September 2001 tests were started with prototype I submarine, in the test basin at the Superior Technical School of Naval Engineers of Madrid. In the first test, the weight/floating torque was so big that the device did not have enough time to react, becoming automatically vertical, with the prow emerging to the surface.

This situation was corrected, managing to achieve greater sensitivity and better equilibrium by bringing the center of mass and the center of flotation closer, but maintaining a certain torque that situated the moving object in a position of vertical equilibrium whenever there was no angular momentum.



At the precise moment that it was placed horizontally in the water, with the propeller functioning, the moving object maintained the horizontal position in the water, rotating around its longitudinal axis driven by the propeller and starting on a curved path along with what is established in the theoretical hypothesis. The moving object described exactly the type of path that was predicted in the computer simulation

When the prototype came to rest, the torque generated by gravity made the stern submerge, given that, as we have expressly stated, it was not balanced. Somewhat vertically positioned, the prow was slightly raised above the water surface. However, after the motor was started and prototype I began to rotate around its longitudinal axis, it changed its position and started on a closed path on the water surface, with a radius that varied depending on the translation velocity, (See animation 3 1 Submarine Prototype I: http://advanceddynamics.net/wp-content/uploads/2014/02/31Submarino_Prototipo_I.mp4).



These tests clearly confirmed that prototype I behaved as both the simulation and our dynamic hypotheses predicted. Rudderless, but fitted out with its own source of rotation around its longitudinal axis, the prototype transformed the new torque into an orbital precession movement. The resultant path of prototype I was circular, in spite of the absence of a central external force generating that path. It was possible to transform the circular orbit into an elliptical one on changing the translation velocity of the prototype. As was predicted in the proposed theory, there was a clear relationship between cause and effect.

We were able to understand the observed behavior of the aforementioned field theory. Let us analyze the velocity fields that are generated on a section of the submarine. The weight and flotation torques generated a second, non-coaxial rotation with the existent one on its

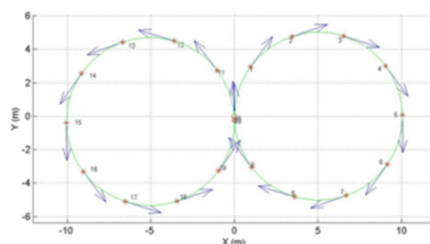
longitudinal axis. This second rotation determines the generation of velocity fields and anisotropic accelerations.

(See video <https://www.youtube.com/watch?v=k177OuTj3Gg&feature=related> and animation 3 2 Submarine anisotropic field:

http://advanceddynamics.net/wpcontent/uploads/2014/02/32Submarino_campo_anisotropo.mp4

But something exceptional occurs: this new, initial distribution of velocities changes when the prototype rotates around its longitudinal axis.

On rotating the disc around its axis of longitudinal symmetry, you get a new distribution of resultant velocities.



Two-dimensional representation of the path of the center of mass of the submarine with change of way every 10 seconds. The numbers indicate time in seconds. (5 Page 186. Figure 3.3, [5])

The result is that, in accordance with the analysis of the velocity fields generated, the torques caused by the weight and flotation have generated a new field of resultant velocities, which causes a rotation of the body around an axis other than that of the external gravitation torque that has acted. The observed result of that new path was circular.



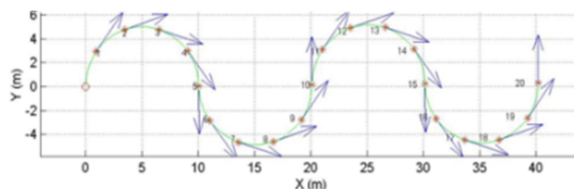
4.2 Prototype II

A tank device was designed as an alternative solution that made it possible to transfer water between two tanks located in the stern and prow with a view to changing the way and also the force of the external torque. This new model, called prototype II, was fitted out with a device to work as a variable torque (animation 3 4 Prototype II:

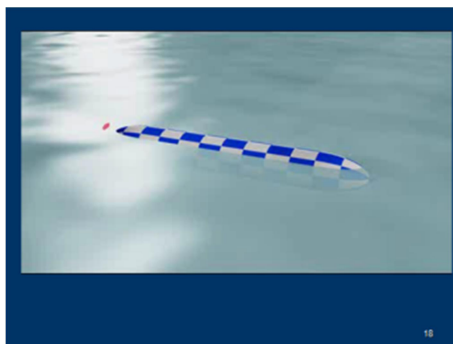
http://advanceddynamics.net/wp-content/uploads/2014/02/34Prototipo_II.mp4).

Transferring water between both tanks changed the position of the center of mass of prototype II, thus making it possible to submerge the prow or stern and thus change the gravitational

interaction torque. After the first tests it was possible to confirm that the tests done with prototype II fully confirmed the theory. The submarine was steered to port or to starboard in accordance with the variation in the gravitational torque. Prototype II could be steered without the rudder in accordance with the dynamic hypothesis of the Theory of Dynamic Interactions (TDI). (See figure 6 and animation 3 5 Prototype II Simulation: <http://advanceddynamics.net/wp-content/uploads/2014/02/35Prototipo II Simulaci n .mp4>).



Representation of the simulated path of the submarine with a change of way of the momentum applied every 5 seconds. (6 Figure 3.5. [5]).

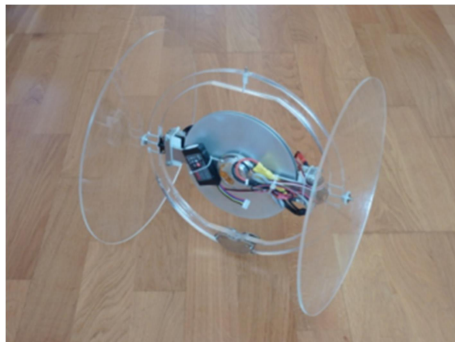


On being subject to simultaneous, non-coaxial rotations, the rigid body caused non-homogeneous velocity fields. These fields generated anisotropic acceleration fields that can be interpreted as inertial force fields created in space by the effect of simultaneous, non-coaxial rotations. The results of our experiments confirmed that it was possible to steer the moving object, both starboard as well as port side, in accordance with the gravitational torque (See animation 3 6 Prototype II Navigation: <http://advanceddynamics.net/wp-content/uploads/2014/02/36Prototipo II .mp4>).

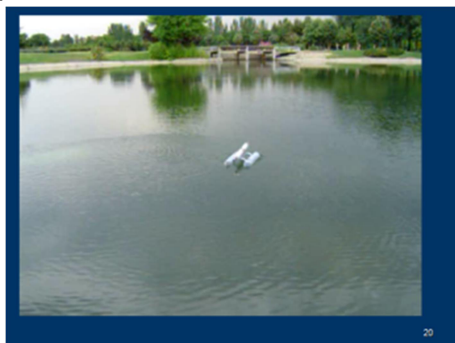


The submarine could be steered without the rudder blade, in accordance with the situations predicted in our hypotheses.

Furthermore, in accordance with our initial hypotheses, there could be a nomological correlation between rotation and orbit and, therefore, that a body with intrinsic angular momentum and translation velocity, subject to a real, spatially non-concurring torque, transforms its induced action into a precession movement. (Page 190, <https://newparadigminphysics.com/animations/>)



We conducted other experiments with other prototypes, for example a rolling prototype or a catamaran carrying a cylinder with rotation on its longitudinal axis. The same results were obtained as predicted by our hypotheses.



Furthermore, in accordance with our initial hypotheses, there could be a nomological correlation between rotation and orbit and, therefore, that a body with intrinsic angular momentum and translation velocity, subject to a real, spatially non-concurring torque, transforms its induced action into a precession movement.

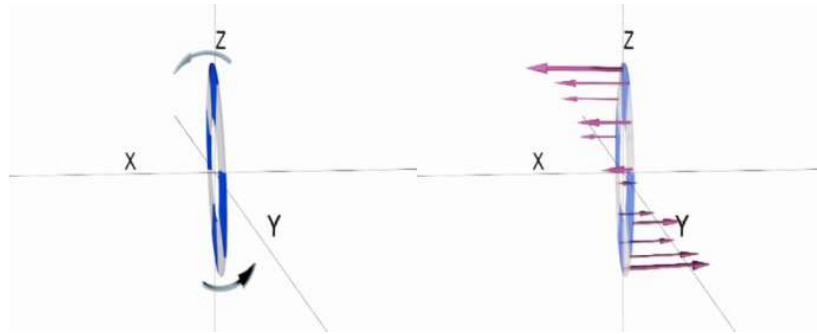
4.3 Dynamic behavior

We intend to analyze the different dynamic magnitudes in the rotating body itself to explain the behavior of our latest experimental tests. In the moving object, velocity fields are generated like the linear translation velocity field and the linear velocity field generated in the rotation around its axis of symmetry, but it is also necessary to simultaneously identify the velocity field generated by the new rotation caused by the non-coaxial torque. (Page 253 [5]. See animation 4 0 translation velocity field:

http://advanceddynamics.net/wp-content/uploads/2014/02/40campo_veloc_translacion.mp4)

We can understand the behavior we observe in our experimental tests by means of the aforementioned field theory. Let us suppose that we can analyze the velocity fields that are

generated on a section of the submarine. In the animation, a homogeneous velocity field of translation is represented.

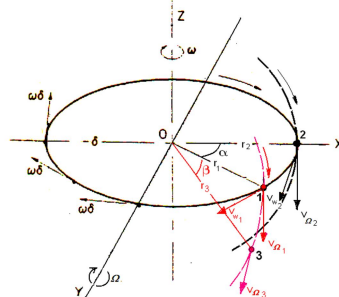


The new rotation that is originated on the Y axis (See the figure on the left) creates a new instantaneous velocity field on a section of the moving body (See the figure on the right). (7 Figures 4.12 [5])

The weight and flotation torques generate a second rotation on its longitudinal axis, which is not coaxial with the existing one (See figure on the right), which determines the generation of velocity and anisotropic acceleration fields.

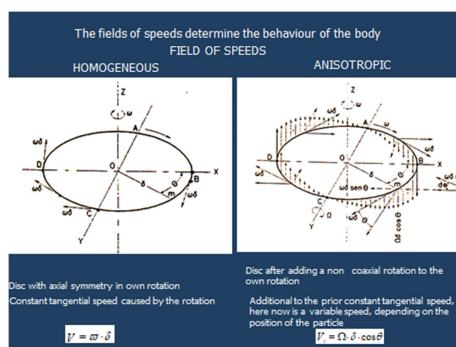
The representation of the velocities in figure on the right is instantaneous, thus it fails to represent the real behavior in nature (Page 255 [5]).

Figure on the right is an idealized image that we present to better understand the evolution of this velocity given that these instantaneous velocities evolve in accordance with the rotation velocities, as can be seen in the following figure.

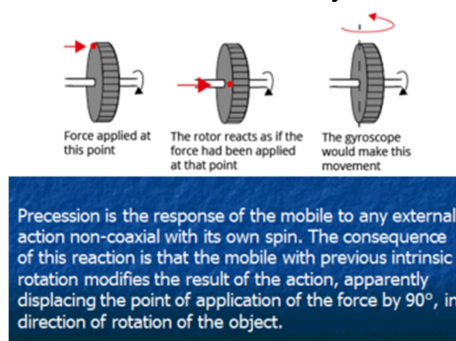


Representation of the evolution of the instantaneous velocities generated by the second rotation. The particles situated in position 1 go to position 3 owing to this new rotation. (8 Figure 4.13 [5])

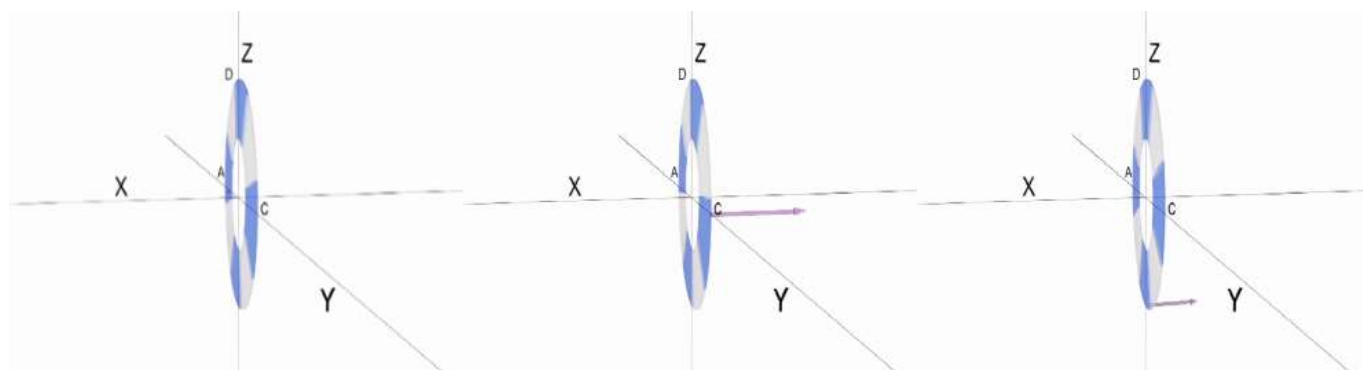
Where does that lead us?



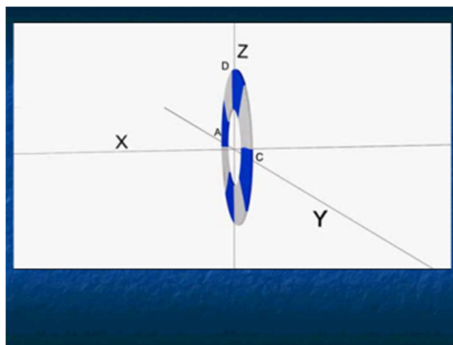
The fields of speeds determine the behavior of the body.



Precession is the response of the mobile to any external action non-coaxial with its own spin. The consequence of this reaction is that the mobile with previous intrinsic rotation modifies the result of the action, apparently displacing the point of application of the force by 90° , in direction of rotation of the object. Let's try to interpret this phenomenon.



Variation of the quantity of movement of a disc particle that rotates around its longitudinal axis of symmetry X (9 Figures 4.14 [5])



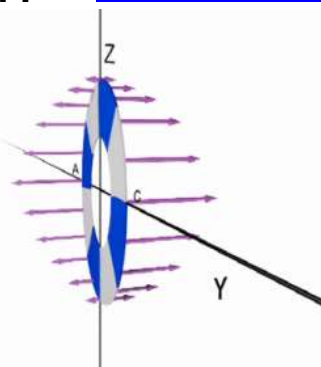
On the disc rotating around its axis of longitudinal symmetry we get a new distribution of resultant velocities as can be seen on the screen (See video <http://vimeo.com/62601974>). For example, the quantity of movement of point C, on account of the new rotation on the perpendicular axis, will be zero initially, but as it continues to rotate with this new rotation, that same point will also be rotating around the axis of symmetry, thus the amount of movement will gradually increase in such a way that on reaching point A, the quantity of movement will be maximum. As of this point, the quantity of movement will gradually decrease again, given that, with the new rotation, its quantity of movement will be going the other way and will subtract from what it already had, until such time as finally cancelling itself out again at point C.

We get the same result, albeit with a negative sign, if we start our analysis at point A.

The result is that, in accordance with the analysis of the velocity fields generated, the torques caused by the weight and flotation have generated a new field of resultant velocities, which causes a rotation of the body around an axis other than that of the external gravitation torque that has acted. . (See figure and animation 4 1 Generation of a new field:

http://advanceddynamics.net/wp-content/uploads/2014/02/41Generacion_de_un_nuevo_campo_.mp4),

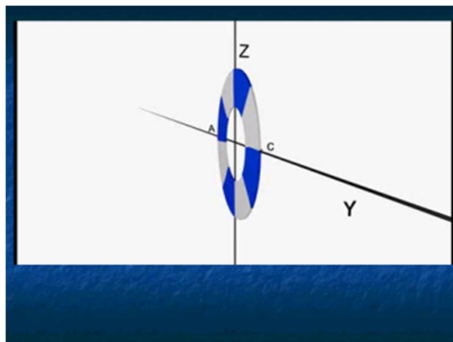
Accordingly, we confirmed that the rotation generated by the gravitational interaction torque does not obey the laws of classical mechanics, or vector algebra: at the end of a half rotation, the second rotation began on an axis perpendicular to the torque that generated it, and not on the axis of the torque defined by the weight and buoyancy. ...let us continue analyzing the true behavior of the moving object. (Page 258 [5] and <https://newparadigminphysics.com/animations/>).



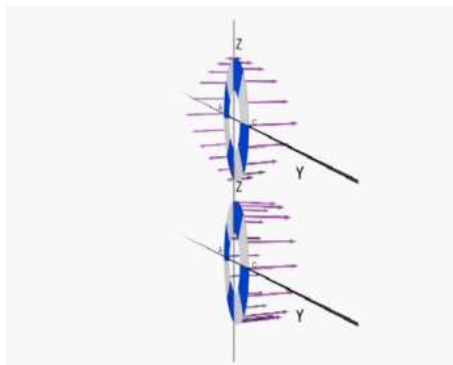
After a full turn, the result will be the generation of a velocity field with a new distribution law, as can be seen in figure: the distribution of resultant velocities on a section of a cylinder endowed

with angular movement on its X axis, and then subject to a torque on a perpendicular Y axis.
(Animation: 4 2 Resultant field.

http://advanceddynamics.net/wp-content/uploads/2014/02/42Campo_resultante.mp4. Page 259 [5])



Generated by the secondary torque, a resultant anisotropic velocity field can be seen in the animation, after a total rotation of the disc, which causes a clearly different distribution to the initial one. It can be seen how this new field creates a new rotation around the Z axis (Page 260 [5]). **Thus we reach the final stage of our analysis:** Velocity coupling.



The anisotropic velocity field generated by the secondary torque (Top figure) dynamically couples with the translation velocity field (Bottom figure), thus generating a new velocity field, which determines the curved path of the moving object (11 Figure 4.16, page 260 [5]).

In accordance with our hypotheses, this new, non-homogeneous velocity field dynamically couples with the translation velocity field.

This means that both fields are added together algebraically, while the rotation on the longitudinal axis remains independent. (See Figure and the animation: 4 3 Velocity coupling:

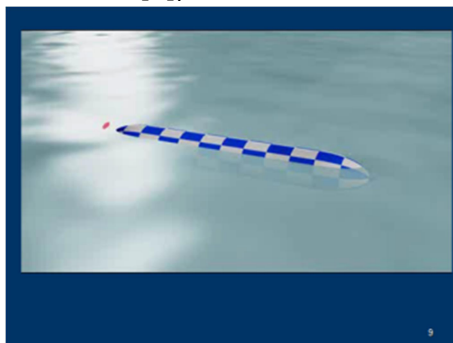
http://advanceddynamics.net/wp-content/uploads/2014/02/43Acoplamiento_de_velocidades.mp4)

We have deduced that the observed path is explained if we assume that the velocity field of the disc rotation or rotor around its axis of symmetry remains independent, and **the translation velocity field are coupled with the anisotropic velocity field generated by the rotation owing to the weight torque.**

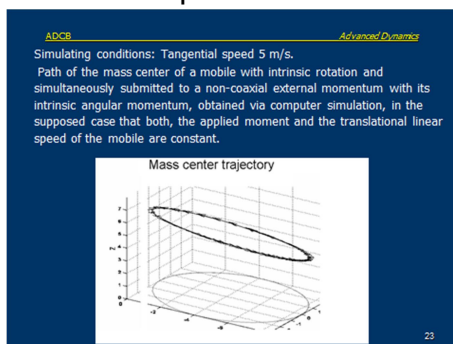
This curved path can be represented by a velocity field obtained by algebraically adding the initial translation velocity field to the non-homogeneous velocity field created by the non-coaxial

torque. This is an important conclusion: **The end translation velocity field generates the resultant path.**

This is our main hypothesis: Our experimental tests confirm what we had perceived in the simulation: namely that, the translational velocity field of the prototype couples with the velocity field generated by the torque caused by weight and buoyancy vector. The result was the circular path observed in the submarine, as further attested to by the flight of a boomerang and the dance of the spinning top (Page 261-262 [5]).



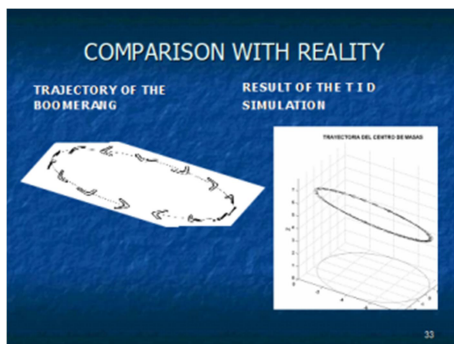
Let's look now at **Simulations**. Various computer simulations were carried out.



Computer simulated path of the center of mass of a moving object with intrinsic rotation and simultaneously subject to an external, non-coaxial torque with its intrinsic angular momentum, when both the momentum applied and the translation velocity of the moving object are constant (12 Figure 5.9, I page 308[5]).

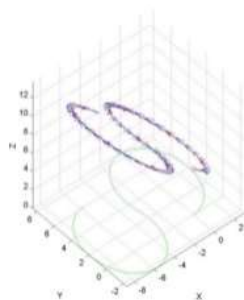
We simulate the behavior of our prototypes, for example, with constant tangential velocity and also constant torque perpendicular to the tangential velocity vector at all times.

A closed and flat path of the moving object can be seen in figure.



We can, for example, compare this calculated trajectory, with the real one of the boomerang (Page 351 [5]).

In such cases and in accordance with the mathematical simulation carried out, a change of path of the center of mass of the moving object is obtained without the action of external forces on it. This mathematical model coincides with the real paths obtained in the experimental tests. The initial dynamic hypotheses seem, therefore, to coincide with the real inertial behavior of bodies in rotational dynamics.



We try with the same tangential velocity, and a torque of constant module.

In the figure we see the trajectory of the center of mass, for this assumption, simulated by computer, when the sense of torque is changing. (13 Figure 5.13 Page. 316 [5], See figures 13 and animation: 5 1 2nd Simulation,

http://advanceddynamics.net/wp-content/uploads/2014/02/512_Simulaci_n_w.mp4)

A summary of everything expressed can be seen in the following **VIDEO I** <https://newparadigminphysics.com/experimental-tests-and-videos/>

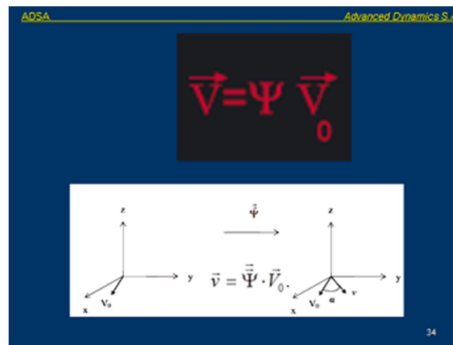
I'd now like to focus on **General equation**

This Theory deduces a general equation of motion for bodies endowed with angular momentum, when subjected to successive non-coaxial pairs, which we call the "general equation of motion of non-inertial systems with axial symmetry".

In this hypothesis, the equation of motion will be determined by the translation velocity of the center of mass of the body, the magnitude of which has not varied and, therefore, will be equal to that of the initial velocity of translation of the body subject to the spatial rotation mentioned

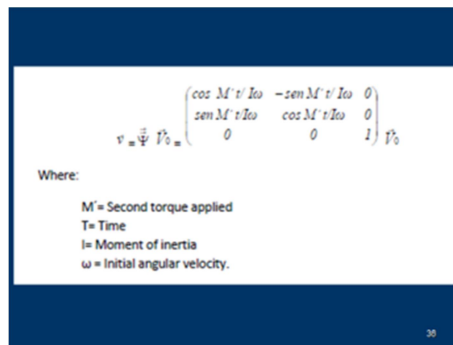
above:

$$\vec{v} = \vec{\Psi} \cdot \vec{V}_0.$$



The indiscriminate coupling proposed in our hypotheses must, therefore, be identified as a spatial rotation of the translation velocity vector, thus (Page. 304):

$$\vec{v} = \begin{pmatrix} \cos \alpha & -\sin \alpha & 0 \\ \sin \alpha & \cos \alpha & 0 \\ 0 & 0 & 1 \end{pmatrix} \vec{V}_0$$



The equation of motion finally turns out to be as follows:

$$\vec{v} = \vec{\Psi} \vec{V}_0 = \begin{pmatrix} \cos M' t / I\omega & -\sin M' t / I\omega & 0 \\ \sin M' t / I\omega & \cos M' t / I\omega & 0 \\ 0 & 0 & 1 \end{pmatrix} \vec{V}_0$$

The rotation operator $\vec{\Psi}$ with angular displacement, transforms the initial velocity \vec{V}_0 into last one \vec{v} , both of which are situated on the same plane. We find that the rotation operator $\vec{\Psi}$ is perpendicular to the velocity and a function of the sine or cosine Ωt , which clearly indicates the relationship between the angular velocity of the orbit, torque $\overline{M'}$ and the initial angular velocity ω . Accordingly, we have obtained a simple mathematical relationship between the initial angular velocity of the body and its translation velocity \vec{v} .

It is a general equation of motion for bodies endowed with angular momentum when they are subject to successive, non-coaxial torques. **It is the general equation of motion of non-inertial systems with axial symmetry.** In this equation, the rotation operator is a matrix that

transforms the initial velocity, by means of rotation, into the velocity that corresponds to the each one of the successive dynamic states (Page 307 [5]).

This Theory conceives a universe with its elements in rotation, and in constant equilibrium, in which, a moment or a pair of forces will generate, while acting, a permanent orbiting movement, in a closed and flat trajectory.



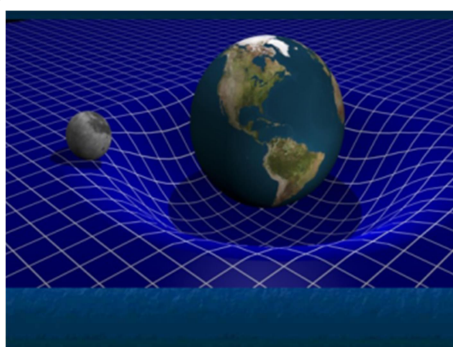
In this cosmos, each celestial body maintains its initial intrinsic rotation constant, thus generating a universe with its elements in constant orbit and in stable dynamic equilibrium, in harmony and not in unlimited expansion.

It is a new conception of celestial mechanics based on dynamic non-inertial hypothesis for bodies accelerated by rotations, which proposes a law of simultaneity of orbit and rotation.

From this conception emerges a cosmos in constant and enduring dynamic equilibrium. This is the balance that the human being has perceived when observing the celestial dome for millennia.

5 Scientific applications

The new theory has also other cosmological implications. Starting from the basis that, according to the General Theory of Relativity, the mass of the Earth deforms the space-time in its environment, the Moon must also make a rolling movement on the curved surface of space-time deformed by the Earth, generating a new rotation of the satellite, that would not be coaxial with the intrinsic rotation that already has.



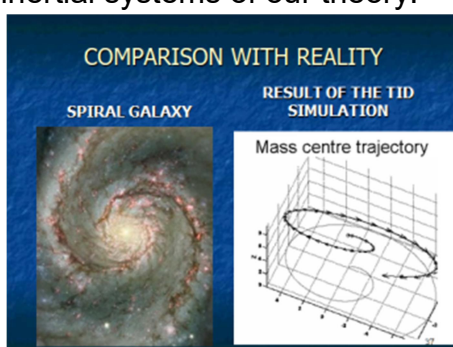
In this case, the dynamic interactions predicted by the theory would be generated, originating the closed and flat orbit of the Moon that we observe. In this way, the behavior of the celestial

bodies is justified, according to the criteria of Relativity, without needing additional pairs or forces.

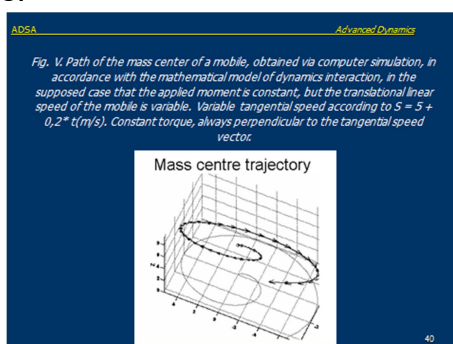
The Theory of Dynamic Interactions suggests, however, that the Theory of Relativity should be revised, and raises doubts about an undefined generalization of the Einstein Principle of Equivalence.

The theory proposes a profound revision of certain concepts of astrophysics and proposes a specific analysis of the fascinating history of human knowledge of the universe, considering their working hypotheses.

Therefore, we propose to extend the analysis of the Theory of Relativity with the new dynamic hypotheses of accelerated non-inertial systems of our theory.



We can justify, in the same way, Kepler's Laws. According to the second, all planets move at a constant areolar velocity. In the case of elliptical orbit, according to our theory, it would be due to a variation of the orbiting speed, which is consistent with the greater deformation of space-time in the vicinity of the central mass.

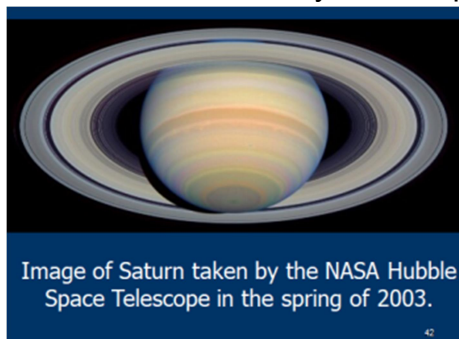


On the other hand, we noticed a great similarity between the spiral galaxies and our simulation for accelerated mobile speeds.

The new scientific theory can also review the understanding of the nature of the atomic structure, since the dynamic reactions analyzed can affect the variation of the energetic levels of the electron and, more particularly, the very concept of spin.

Our theory can also influence the concept of quantization of Planck radiation, and its constant, since our new theory could be related to the notion of spin and be explained with the help of our theory. We even proposed that this minimum value of the physical quantities can be justified by the value of the angular momentum of the atomic particles.

Through this model of dynamic interactions, one could even justify how a body in rotation can initiate an elliptical, circular or even helical trajectory, without the existence of a true central force. According to this dynamic model, the application of a pair of forces to a body with intrinsic rotation, generates a stable system, and in constant dynamic equilibrium.



See the image of Saturn taken by the NASA Hubble Space Telescope.

This theory can also provide the explanation of the formation of rings, and in general of all the plane celestial systems in rotation, that we observe in our universe.

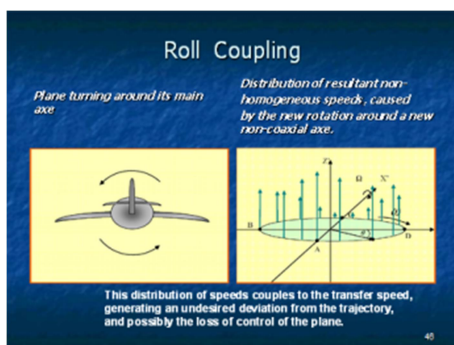
The dynamic model of our theory justifies finally a flat image of the cosmos in which galaxies and systems also tend to develop in flat structures, like ours solar systems, Saturn's rings, the asteroid belt, also the Kuiper belt or the Dispersed Disk.

6 Technological applications

The application of these dynamic hypotheses to astrophysics, astronautics and other fields of physics and technology will possibly allow new and stimulating advances in research.

The result of this project is the conception of an innovative dynamic theory, which is specifically applicable to physical systems in rotation, and which has numerous and significant scientific and technological applications.

This theory can also have numerous technological applications in the control of movement, in astronautics, in nuclear fusion plants or to interpret climatological phenomena with masses of fluids in rotation, such as typhoons or tornadoes.



With the aid of the Theory of Dynamic Interactions, a ship without a spade rudder, with energy saving, or a spaceship could be governed. Or to understand the Roll Coupling of airplanes.

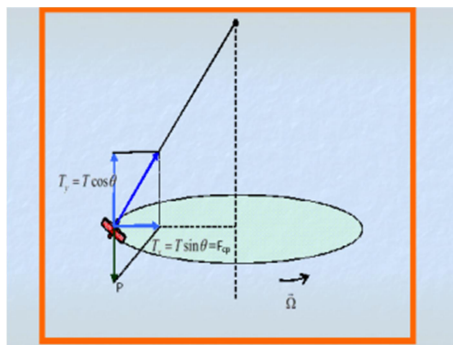
This theory can also be applied in the confinement of plasma in nuclear fusion reactors. Finally, this research presents a special interest to consider in Physics the exploration of accelerated systems in general, and highlights the need to develop scientific research projects for the evaluation and analysis of their postulates, as well as technological projects based on these hypotheses.



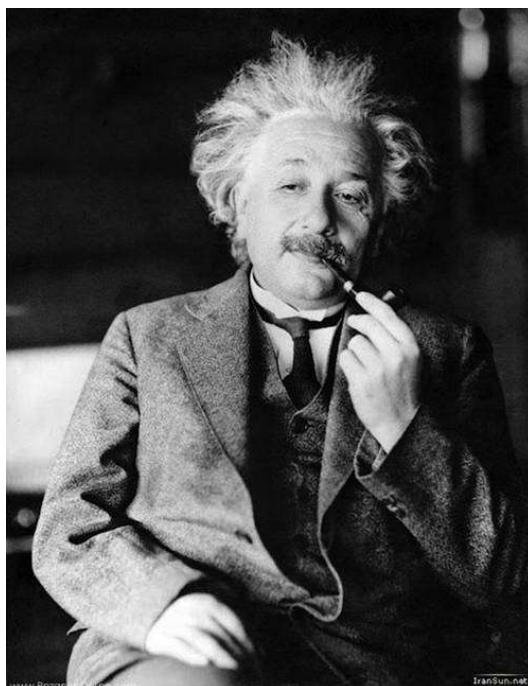
7 Other phenomena

In our research, we have identified other interesting phenomena that can be easily explained thanks to our theory. We have completed experimental test son these phenomena which have been recorded on video and can be viewed, or even repeated with reduced investment. We can remember, among others, the case of the boomerang. Also the monograph Video on *The Flight of the Boomerang II*, by Sanchez Boyer, J.: <https://vimeo.com/129383447>

The one made by Pérez, L. A.: *Reflecting New Evidence on Rotational Dynamics*, 2013: <http://vimeo.com/68763196>.



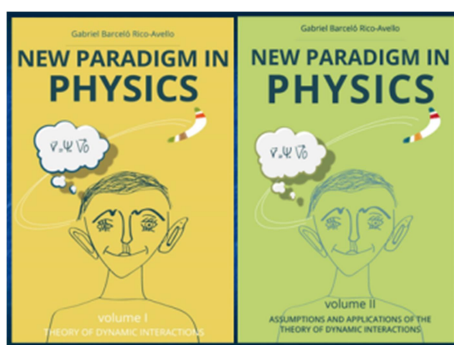
And, *The Pendulum of Dynamic Interactions*, www.advanceddynamics.net/the-pendulum-video, Or *The Dance of the Spinning Top*: www.advanceddynamics.net/spinning-top-video/



8 New paradigm

The theory proposed by our research is fully consistent with Einstein's theory of general relativity, and with Kepler's laws, but it allows to justify other characteristics of the behavior of the celestial bodies, not foreseen in the other two models, such as the Dynamic equilibrium of the universe, the plane celestial systems or the rings of Saturn.

The theory has been developed over the last forty years. Now it has come to light through a series of articles published in scientific journals and a treatise in two volumes: **NEW PARADIGM IN PHYSICS**.



You can consult these videos about the content of the treaty:

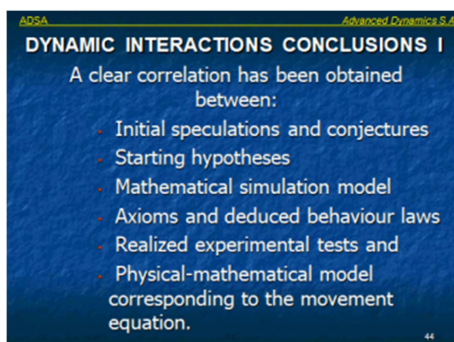
<https://www.youtube.com/watch?v=GapMJEfHJjU>

<https://www.youtube.com/watch?v=45kUpdAXICw>

<https://www.youtube.com/watch?v=Gbx5wdQgTTs>

<https://www.youtube.com/watch?v=vpcgxKWJWyE>

To sum up, our proposal complements the theory of general relativity, and confirms that the Newtonian model was at the time a useful, but conceptually erroneous calculation tool for non-inertial systems.



A clear correlation has been obtained between:

- Initial speculations and conjectures
- Starting hypotheses
- Mathematical simulation model
- Axioms and deduced behavior laws
- Experimental tests carried out, and
- Physical-mathematical model corresponding to the movement equation.

This new research raises consequently, a substantial change in the basic assumptions, or models, within the dominant theory of science, so it constitutes a **new paradigm in Physics**, which had not been enunciated to date.

This research suggests that by combining General Relativity with ours dynamic proposals, a model of the cosmos could be defined, which would possibly be more coherent with the observable universe.

For this reason, we argue that **a change of mindset in current Physics is necessary**, which allows us to accept the true behavior of mobiles subject to variations in its speed, in space.

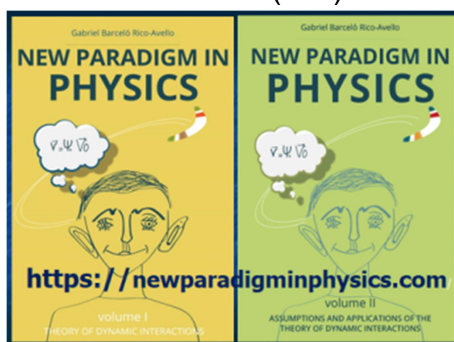
It would be a mental transformation similar and equivalent to that which occurred in our collective perception when viewing, first the astronauts, and then the whole world society, the Earth from space.

By noticing its environmental and ecological fragility, and possibly also, after the Chernobyl disaster, the arms race was probably quieted, in the face of fear that the human race might disappear, the victim of its own technological and weapons-related successes.

For the authors of this research, it does not seem logical that nature has to be explained with different structures of knowledge, not related to each other: Classical Mechanics, Quantum Mechanics, Theory of Relativity, or even Wave Mechanics.

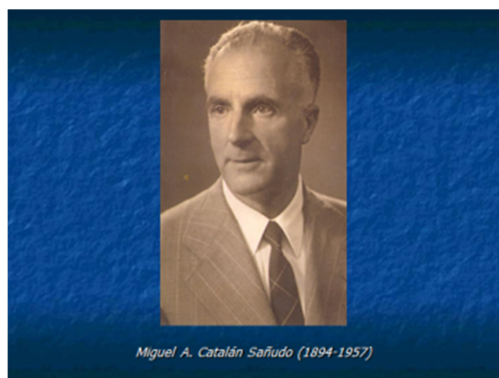
Rather, we consider that this situation reflects an attempt to know our environment with different approaches, each one obtaining its own successes, but without there being unique criteria and results.

The behavior of nature must, logically, respond to a single model, whose description must be unique, so they must find bridges or links between these structures of mechanical knowledge. In our opinion, the Theory of Dynamic Interactions (TID) is one of those possible bridges.



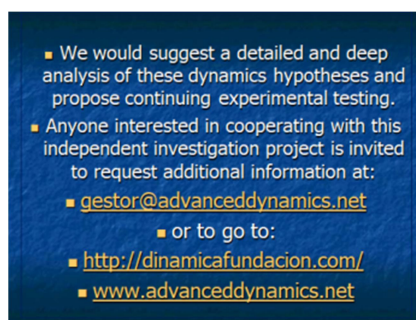
We suggest to access to this website to better understand all of the above, and our treatise **NEW PARADIGM IN PHYSICS**: <https://newparadigminphysics.com/>

In this treatise the laws of this new and unpublished theory are formulated, since it is a compendium of the research carried out by the group of experts of Advanced Dynamics during almost forty years. Its results and conclusions have been tested and confirmed by experiments and computer simulations, and provide a new perspective on the dynamics of the cosmos, hitherto unknown: a NEW PARADIGM OF PHYSICS, totally coherent with the theories of relativity or Kepler's laws.



I will always remember my teacher Miguel Catalán Sañudo, source of inspiration for new ground-breaking breakthrough in physics.

There is a wide collection of videos in references to the Theory of Dynamic Interactions, and related in the annex.



Further information on our research project can also be found at:

<http://advanceddynamics.net/en/>
<http://dinamicafundacion.com/>

I would be happy to answer your questions.

THANK YOU VERY MUCH FOR YOUR ATTENTION.

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For a more complete documentation on the Theory of Dynamic Interactions, please visit:

<https://newparadigminphysics.com/es/inicio/>

<http://www.advanceddynamics.net/>

<http://www.dinamicafundacion.com/>

<http://www.tendencias21.net/fisica/>

EXPERIMENTAL TESTS AND VIDEOS

Several test experiments have been conducted over recent years, the results of which have been fully satisfactory. These tests serve to confirm the dynamic hypotheses that underpin the Theory of Dynamic Interactions. Videos have been recorded of these tests that can be seen at the following links:

Theory of Dynamic Interactions_1

<http://www.youtube.com/watch?v=P9hGgoL5ZGk&feature=related>

Theory of Dynamic Interactions_2

<http://www.youtube.com/watch?v=XzTrGEtJGXU&feature=related>

Theory of Dynamic Interactions_3.avi

<http://www.youtube.com/watch?v=dtMqGSU9gV4&feature=related>

Theory of Dynamic Interactions_4.avi

<http://www.youtube.com/watch?v=qK5mW2j2nzU&feature=related>

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<http://www.youtube.com/watch?v=XzTrGEtJGXU&list=PL3E50CF6AEBEED47B>

<http://www.youtube.com/watch?v=dtMqGSU9gV4&list=PL3E50CF6AEBEED47B>

<http://www.youtube.com/watch?v=qK5mW2j2nzU&list=PL3E50CF6AEBEED47B>

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<http://www.youtube.com/watch?v=vSUkd4sIHGQ>

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<https://vimeo.com/62247544>

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<http://vimeo.com/68763196>

Sanchez Boyer, J.: *The Flight of the Boomerang II*, Video. 2015.
https://www.dropbox.com/s/stng5b2co1441hk/Boomerang_ENG_mini.mp4?dl=0
<https://www.youtube.com/watch?v=mGfrGW5fhOg&feature=youtu.be>
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Pérez, L. A. *The Pendulum of Dynamic Interactions*. Video. 2015.
www.advanceddynamics.net/the-pendulum-video.
https://www.dropbox.com/s/rrib1786ub75a8h/PIDing_m.mp4?dl=0

Pérez, L. A.: *The Dance of the Spinning Top*. Video, Valladolid, 2015.
www.advanceddynamics.net/spinning-top-video/

VIDEOS ABOUT THE TREATY NEW PARADIGM IN PHYSICS:

<https://www.youtube.com/watch?v=MRq7EclUsbA>
<https://www.youtube.com/watch?v=tTLDvLUdgro>
<https://www.youtube.com/watch?v=xCDElbo89Ps>
<https://www.youtube.com/watch?v=QYcT8OlqzEU>