JANUS COSMOLOGICAL MODEL

TO THE ATTENTION OF THE SPONSORS

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Pr. Jean-Pierre Petit

Jppetit1937@yahoo.fr

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Our technology is constantly advancing very fast.

　We have cell phones equipped with cameras that give excellent resolution and allow us to make videos. The communication network has become global. We have access to all kinds of information that our predecessors could not even dream of.

　We are designing more and more sophisticated robots, in all fields, as well as new materials. Nanotechnology is opening up new areas of technological application.

　Our meteorologists have access to daily data on a planetary scale, thanks to a network of observation satellites.

　We have sent men to the Moon and robots to Mars. Our telescopes, on the ground and in space, and our radio telescopes operating in networks, allow us to capture data at ever greater distances, involving access to the state of the universe in its most distant past.

We have successfully made the first measurements of gravitational waves.

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But :

- Since 1970, the search for the intimate structure of matter has come up against a wall. While from 1890 to 1970 theory and experiment had mutually reinforced each other, after these "glorious eighties" the manna has suddenly dried up.

- Superparticles, the logical extension of the standard model, refused to appear in powerful particle accelerators.

- The cosmological model, based on Einstein's equation, suddenly failed. So that it was necessary to invoke unknown components, grouped under the term dark matter. All attempts to identify it have been failures, for fifty years.

- In 2011, the discovery of the acceleration of the cosmic expansion forced theorists to invoke a mysterious "dark energy", whose nature nobody is able to define.

- To justify the extreme homogeneity of the early universe, discovered in 1988, the action of a field of inflatons, also undefined particles, is invoked.

- For a century, there has been no model to explain the absence of observation of primordial antimatter.

- We have no model of galaxies today. Their dynamics, their formation and evolution patterns remain complete mysteries.

On the basis of these few lines we can only note that the three disciplines of fundamental science that are :

- Cosmology

- Astrophysics

- Theoretical physics

have been experiencing an unprecedented crisis for more than half a century, that specialists try to hide by flooding the public with synthetic images and books, articles, broadcasts where everything is now composed in the conditional tense with "would be ... could ... would explain ... would constitute a model of ... ".

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In this context, a new cosmological and theoretical physics model is presented, the Janus Model, which includes concrete and successful developments in all three directions, having been the subject of an uninterrupted series of publications in high-level peer-reviewed scientific journals. This model is based on seventeen observational confirmations.

To summarize, the Janus model introduces, in the universe, components of negative mass (and in theoretical physics of quantum states of negative energy).

The reader will object that such advances have not yet aroused the interest of the specialist community. To this we will reply that this is the fate of any truly innovative and, let us say, revolutionary approach. As an example we will mention geometric algebra, an extension of Clifford's algebra (1845-1879). Developed since the seventies by David Hestenes, Anthony Lasenby, Stephen Gull, Chris Doran, it proves its remarkable efficiency as a new universal language of physics, but it is only just beginning to reach the community of theorists, fifty years after the first works in this field. However, this simple and efficient language, allowing to build bridges between disciplines considered as foreign until now, will soon impose itself by implying a complete rewriting of all theoretical constructions of physics.

A didactic presentation can be found in the forty "Janus" videos, as well as a summarized presentation in the video Janus 29, of one hour and forty minutes.

We will only recall the observational confirmations of the model :

1: The model fits with local relativistic observations: Mercury perihelion advance, gravitational lensing effect due to the Sun. [7], [9], [13]

2 : It solves the paradox of the non-observation of primordial antimatter, invisible, because it has a negative mass [9].

3 : It is the only one to give a precise nature to the invisible components of the universe. These are antiprotons, antielectrons and anti neutrons of negative mass. [9]

4: It explains the homogeneity of the early universe, which is an alternative to the inflation model. [5], [7]

5 : It accounts for the fluctuations in this CMB [14]

6: It perfectly accounts for the observational data referring to the acceleration of the cosmic expansion. [13]

7: It explains the lacunar structure of the visible part of the universe, at very large scale. [7] ,[8]

8 - It is the only one to provide the explanation of the phenomenon of the "dipole repeller" as a vast empty area, pushing back the galaxies, at 600 million light-years distance. It is a spheroidal conglomerate of antimatter of negative mass. [7]

9 - It accounts for gravitational lensing effects in the vicinity of galaxies, attributed to dark matter. [7]

10 - It accounts for the flat shape of the rotation curves of galaxies, in the periphery. [7]

11 - It accounts for the phenomena of gravitational mirages in the vicinity of galaxy clusters. [7]

12 - It accounts for the spiral shape of galaxies. [8]

13 – It accounts for the image of the object located at the center of M-87. It is not a "giant black hole" but a "plugstar", an alternative model to black holes.

14 – It explains why galaxies with high redshift have low magnitudes. [9]

15 – It solves the question of the "pre-Big Bang": at this point, time reverses. [1] , [2]

16 – It extends quantum mechanics by showing that the Dirac and Schödinger equations generate negative energy states. [15], [17]

17 - The model makes interstellar travel not impossible [10].

The research process, in this "Janus" framework, requires very particular scientific and human skills. Indeed it is not less than to raise oneself to the level of the founding fathers of modern science: Dirac, Schrödinger, Bohr, Einstein and all the others. It is therefore not a question of making calculations based on old material, but of renewing it. Thus, in cosmology and astrophysics, it has been necessary to replace Einstein's equation by a system of coupled field equations:

$$R_{\mu\nu} - \tfrac{1}{2} R\, g_{\mu\nu} - \Lambda g_{\mu\nu} = \chi\, T_{\mu\nu}$$

$$\longrightarrow$$

$$R_{\mu\nu}^{(+)} - \tfrac{1}{2} R^{(+)} g_{\mu\nu}^{(+)} = \chi \left[T_{\mu\nu}^{(+)} + \sqrt{\frac{g^{(-)}}{g^{(+)}}}\ \widehat{T}_{\mu\nu}^{(-)} \right]$$

$$R_{\mu\nu}^{(-)} - \tfrac{1}{2} R^{(-)} g_{\mu\nu}^{(-)} = -\chi \left[\sqrt{\frac{g^{(+)}}{g^{(-)}}}\ \widehat{T}_{\mu\nu}^{(+)} + T_{\mu\nu}^{(-)} \right]$$

We can therefore only entrust this work to scientists

who are finders and not researchers.

Only the Belgian mathematician Nathalie Debergh has shown over the last five years that she meets these criteria [15],[17]. We therefore solicited donations in 2021 to allow her to devote herself half-time to this research for two years. This operation represented a total of 100,000 dollars. This collection was done via a non-profit association Support Janus, which is able to manage any financial contribution, private or institutional. Mrs. Debergh's approach is a complete rewriting of quantum mechanics through geometric algebra

What needs to be done to develop this research?

At this point, there are only two possible avenues:

- To ensure that Ms. Debergh can continue her research.

- Incentivize, in the form of bonuses, already confirmed scientists to contribute to this Janus enterprise by publishing work in specialized journals at the highest level (Nature, Physical Review D, Physical Letters, etc)

Our principle is to provide material support only to scientists

who have demonstrated a real capacity for innovation, at the highest level.

This is a long term research, of maximum ambition. It is nothing less than to rebuild cosmology, astrophysics and quantum mechanics on new foundations. To collaborate effectively in such an undertaking, scientists need to be able to devote themselves to it full-time with job security.

Universities in all countries and in France the CNRS respond to this question by providing researchers with permanent positions, giving them a civil servant status. But this system has only one flaw: recruitment is entrusted to the people already in place, who then define a profile and advocate integration into teams that have already been formed.

However, these teams have largely demonstrated, in half a century, their sterility, as well as the sterility based on the research themes they recommend and, consequently, the inadequacy of the profiles through which the selection of candidates is made. In all countries, in theoretical research units, full-time researchers are paid for decades to find nothing, and accumulate theses and publications that are only worth their weight in paper.

This situation has its counterpart in the French Academy of Sciences, in the specialties concerned. One of the academicians, working in particle physics, was admitted on the basis of his work on the "photino", a supersymmetric particle that has never been observed. In another field, his theoretical work on galactic dynamics is completely inconsistent. Finally, another academician centers his cosmology work on a mathematically incoherent model. All of them have obviously been rewarded by many prizes, for their non works.

Nathalie Debergh , mathematician, holder of a doctoral thesis and having to her credit more than one hundred publications in high level journals, judged too independent, could not find a place in the Belgian university and had to fall back on a teaching position in a technical school where, which represents a total waste of skills.

She has in 2018 and 2022, through two important publications in high level, peer-reviewed journals, demonstrated her qualities as a finder [15], [17]. Her current work is a reformulation of quantum mechanics through geometric algebra.

The most obvious and urgent measure should be her integration in the Belgian university, on a research position, unless the French Cnrs welcomes her in its midst. But in the present context, this is only a wishful thinking. Thanks to private donations (100,000 dollars), we have obtained from her employer that she can be put on availability half-time for two years, her complementary salary being paid to her by the association Support Janus. But her status does not allow her to be available full-time, which would obviously have been desirable. It is not certain that this availability can be extended beyond 2023. She cannot, of course, give up the security that her status as a civil servant confers on her. For this to be feasible, a sponsorship operation would have to ensure her a permanent job during the 11 years that separate her from her retirement, which represents an envelope amounting to two million euros (including charges).

For the sake of completeness, we will mention the recent publication of the Canadian Benoit Guay[1] (62 years old), made in 2022 in the high level journal Modern Physics Letters A [18] which, through the quantum theory of fields, is part of this process of introducing negative energy states into theoretical physics and thus represents a new stone brought to the model. Like Nathalie Debergh[2], he could not find a place in the Canadian authorities of theoretical research and assures his subsistence by occupying the function of guardian of a group of buildings. As an incentive, the Janus Support Association has, within its very modest means, paid him a bonus of 2000 dollars in 2022. It is up to the Canadian Government to ask itself how a researcher engaged in promising research, who places his work in one of the most highly rated journals in the discipline, was obliged to get a job as a janitor in order to live.

Personally, being retired, I will be able to continue this research by ensuring by myself the archiving of all the works, without any purse, through a book in the course of drafting, which will be placed at the disposal free of charge on Internet via my site " Savoir-sans-Frontières ", with translations in several languages. For me, the central problem is not my material situation, but my life expectancy. Born in 1937, at the time I am writing these lines I am 85 years old.

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[1] Benoit.guay@manaty.net . Born in 1960.

[2] n.debergh@yahoo.fr Born in 1966.

Conclusion :

This file, intended for candidate-sponsors, is not very optimistic and is more informative than anything else. Financially, it could be summarized as follows:

We need two million euros to allow Nathalie Debergh
to work full time on our research, in good conditions.

For one may be skeptical that France, Belgium, or even a European country, realizes the chance to occupy a leading position in the field of global theoretical research: in all countries, the assignment of a research position to a 56 year old candidate has little chance of being considered.

The Janus model is currently, with its 17 observational confirmations, the only alternative to get out of the crisis that cosmology, astrophysics and theoretical physics have been experiencing for more than half a century. But the media (written press or television) show a guilty silence in front of the results already obtained. A sponsoring action could thus be centered on the purchase of pages in the written press or airtime on television (particularly in the United States).

Finally, this sponsoring could concern the proposal of bonuses to confirmed scientists who manage to publish work within the framework of the Janus model, in the highest level journals, true sanctuaries of official science: Nature, Physical Review D, Physical Letters, Monthly Notices, etc.

Références :

[1] **1977** : J. P. Petit, Univers Enantiomorphes à flèches du temps opposées, Compte Rendus de l'Académie des Sciences de Paris du du 8 mai **285**, pp. 1217–122

http://www.jp-petit.org/papers/CRAS/cosmology_1977a.pdf

→ *Enantiomorphic universes with opposite arrows of time.*

First draft, Newtonian and non-relativistic, of the Janus model

 [2] **1977** : J. P. Petit, Univers en interaction avec leur image dans le miroir du temps, Compte Rendus de l'Académie des Sciences de Paris du 6 juin, t. 284, série A, pp. 1413–1416, présenté par le mathématicien André Lichnérowicz.

http://www.jp-petit.org/papers/CRAS/cosmology_1977b.pdf

→ *Universes interacting with heir image in the time mirror*

Continuation of the previous note. Reflection on the inversion of the time coordinate.

[3] **1978** : J.P.Petit : le retournement non trivial du tore. CRAS t.287 (20 nov).

http://www.jp-petit.org/papers/CRAS/geometry_1978d.pdf

And   http://www.jp-petit.org/papers/pls-jan79.pdf

http://www.savoir-sans-frontieres.com/JPP/telechargeables/Francais/LE%20TOPOLOGICON.pdf

A second non trivial eversion of the torus.

 Mathematical prelude (topology) to the topological support of the Janus model.

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http://www.jp-petit.org/papers/CRAS/geometry_1981.pdf.

The first analytic set of equations to figure the Boy surface.

 [5] **1988** : J.P.PETIT : Cosmological model with variable velocity of light. Modern Phys Letters A3, pp. 1527.

http://www.jp-petit.org/papers/cosmo/1988-ModPhysLettA-1.pdf

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[6] 1994 : J. P. Petit, Nuovo Cimento B. The missing mass problem. **109**, 697.

First draft of the Janus Cosmological Model. .

[7] **1995 :** J.P.PETIT, Twin Universe Cosmology, Astrophys. and Sp. Science, **226**, 273-307.

http://www.jp-petit.org/papers/cosmo/1995-AstrophysSpaceSci.pdf

Introducin negative lensing effect.

[8] **2001** : J.P.PETIT, P.MIDY & F.LANDSHEAT : Twin matter against dark matter. Intern. Meet. on Atrophys. and Cosm. "Where is the matter ? ", Marseille 2001 june 25-29

http://www.jp-petit.org/papers/cosmo/2001-where-is-the-matter.pdf

The second matter, with negative mass, corresponds to the extension of the restricted Poincaré group to the entier group, including negative energies. Introducing joint gravitational instabilities. Spiral structure : results.

[9] **2014** : J.P.Petit, G.D'Agostini : Negative Mass hypothesis in cosmology and the nature of dark energy. Astrophysics And Space Sccience,. *A* **29**, 145-182.
http://www.jp-petit.org/papers/cosmo/2014-AstrophysSpaceSci.pdf

First model described by two interacting field equations. The negative species drives the acceleration of the cosmic expansion.

[10] **2014** : J.P.Petit, G.D'Agostini : Cosmological Bimetric model with interacting positive and negative masses and two different speeds of light, in agreement with the observed acceleration of the Universe. Modern Physics Letters A, Vol.29 ; N° 34 ; Nov 10th.
http://www.jp-petit.org/papers/cosmo/2014-ModPhysLettA.pdf

The Janus Cosmological Model with two different speeds of light.

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[15] **2018.** N.Debergh, J.P.Petit and G.D'Agostini : Evidence of negative energies and masses in the Dirac equation through a unitary time-reversal operator. , J. Phys. Comm. **2**
http://www.jp-petit.org/papers/quantum-mechanics/2018-journal-of-physics-MQ.pdf

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[16] **2019 :** J.P.Petit, G. D'Agostini, N.Debergh : Physical and mathematical consistency of the Janus Cosmological Model (JCM). Progress in Physics Vol.15 issue 1.
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http://www.jp-petit.org/papers/quantum-mechanics/2022-Nathalie-PhysLettA.pdf

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http://www.jp-petit.org/papers/quantum-mechanics/2022-ModPhysLettA-Guay.pdf

Method for generating and detecting negative mass and energy particles in the laboratory.

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Videos :

- Forty videos representing a presentation of the Janus cosmological model :
  In french. Most of them have english subtitles.

http://www.jp-petit.org/nouv_f/VIDEOS_JANUS.htm

- Contents :

http://www.jp-petit.org/janus/Janus_contents.pdf

- Synthesis of the presentation of the Janus cosmology model (one hour and forty minutes):

https://www.youtube.com/watch?v=RXKONGBClY0

The plugstar model, alternative to the black hole model (1 h 20):

https ://www.youtube.com/watch?v=dqeOWRzohr0

- Its long version, for " minimum maths speciale level " (6 h 20) :

https://www.youtube.com/watch?v=RKmxVKINk8A