



HAL
open science

Ontological Math][Physics mirror between Noether and Planck

Francis Maleval

► **To cite this version:**

Francis Maleval. Ontological Math][Physics mirror between Noether and Planck. 2020. hal-02391730v1

HAL Id: hal-02391730

<https://hal.science/hal-02391730v1>

Preprint submitted on 13 Jan 2020 (v1), last revised 23 Jul 2020 (v2)

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Ontological Math][Physics mirror between Noether and Planck

Francis Maleval

Abstract

A mirror built here, by virtue of an iterative process, a geometry from a conceptual object. This dynamic, served by the Noether's theorem, generates the universal constants.

Mirror and Singularity:

In Math : undefined][order, imaginary][real, irrational][rational, one][multiple, prime][composite, ln][exp, primezeta][zeta [1, 2], odd][even [3], Goldbach][Matiyasevich [4], arithmetic][geometry [5], ... null = 0][$1 = e^{i\tau}$ (with $\tau = 2\pi$) ; π , as the observer, is on the surface of the paradox.

In Physics : chaos][order, discrete][continuous, QM][GR [6], permittivity][permeability, quantum entanglement][locality, time][space, energy][matter, wave][corpuscle, electromagnetism][gravitation, ... vacuum = 0][$1 = \epsilon_0\mu_0c^2$; π , as the observer, is on the surface of the paradox.

ϕ , π , e are mathematical concepts which are constitutive of physics. It is conceivable that a causal structure grants its attributes to the physico-mathematical couple that gives body to the information.

* Christian J.Bordé, academician, writes about the fine structure constant: "*The whole of electromagnetism should be described by means of this constant alone, without the help of any additional base unit, or any other fundamental constant ... such as the electron charge. This point can be discussed in more concrete terms by means of Dirac and Maxwell's equations*" [7].

* Pierre Fayet, academician, specifies : "*The charge of the electron is a quantity both measured and dimensionless ... The coulomb, unit of electric charge, is a unit derived from the mechanical and even geometric units, while of course also being dimensionless*" [8].

With q the Planck charge, put $@ = f(\alpha) = q^2/10^7$, the ultimate quantum of interaction. This in"form"ation emerges in dimension on the two characteristics of the vacuum implicitly related to π , the unit $\epsilon_0\mu_0c^2$. Its numerical value $q^2/10^7$, ie $3.51767294 \times 10^{-43}$, is similar to that of Codata 2018 for the quantum ml/c^0 (at rest), ie $2.176434 \times 10^{-8} \times 1.616255 \times 10^{-35} = 3.51767233 \times 10^{-43}$, for the quantum \hbar/c^1 , ie $1.0545717 \times 10^{-34} / (2.99792458 \times 10^8) = 3.51767255 \times 10^{-43}$, for the quantum Gm^2/c^2 , ie $(6.67430 \times 10^{-11})(2.176434 \times 10^{-8})^2 / (2.99792458 \times 10^8)^2 = 3.51767183 \times 10^{-43}$.

**One information @
avatar of the duo q^2
defines the geometric sequence
 $c^0@ = ml$ $c^1@ = \hbar$ $c^2@ = Gm^2$**

The Planck units [9] are defined from the universal physical constants. Ontologically we note that the coupling constant, intrinsic to the Planck charge, generates on space-time the interlacing of the dimensioned constants ml , \hbar , G , iterated in geometric progression of reason c , the speed of light. As α is also "*the ratio of the velocity of the electron in the first circular orbit of the relativistic Bohr atom to the speed of light in the vacuum*" [10], we have here one-all: "*A very simple structure is not incompatible with the inexhaustible character of the information contained as well in physics as in mathematics*". Alain Connes [11]

Mirror and Iteration:

The surface of the mirror, on which stands the observer, is comparable to a knot of symmetries, the inseparable couple **principle**[image like $e = mc^2$ for example.

The dynamic of the image towards its antecedent arises inescapably from the imbalance of the attributes of the faces of the mirror which remains one. The resulting in"form"ation, intrinsically an interaction, is therefore both absence and presence of limits, of dimensions. The relativity of the observation is the result of the severe constraints of the coupling and of its constancy on the attributes at the same time imaginary and real of this knot.

"Isn't the incommensurable in general that which escapes reason or that reason cannot account for since reason as ratio is first of all an ability to put in report? This would suggest that reason and measure are not only linked, but they identify themselves"[12]. The conceptual alpha of the physicist, fine structure of this mirror, is a quantity both *number* and *report* which generate the elementary duality wave][corpuscle ; this ratio is also that of their movement.

Let @, function of alpha, this quantum of interaction associated with the space/time, *geometry* of the observer: @ is at the center of this interlacing according to the slogan "*order+number=geometry*"[13] taking into account the theorem of David Malament [14]. At the Planck scale his transformations, inherited from the attributes of the knot, loop in an iterative mode ; the information @, avatar of the duo q^2 , defines the geometric sequence : $c^0@ = ml$ $c^1@ = \hbar$ $c^2@ = Gm^2$

In this borromean knot descended from the only constant of fine structure, there is equivalence of relations; the numerical values with homogeneous quantities depend only on the invariant $@ = f(\alpha)$, the time and the length of Planck, since $@ = q^2/10^7 = ml/c^0 = \hbar/c^1 = Gm^2/c^2$ [15]. It is an economy of means [16] sealed by the Noether's theorem [17].

Reflection:

- * To say that the mass deforms the space-time which is energy ($\acute{\epsilon}\nu\acute{\epsilon}\rho\gamma\epsilon\iota\alpha$, force in action) would be to say that the mass is deformation of space-time.
- * Gm^2 would be a quantum.
- * From metaphor to metonymy, from the mirror stage q^2 [ml to identity, there is dynamic of the [referent], of signifiers [c^0, c^1, c^2] in exponential evolution, of signifieds [particle, action, gravitation].
- * An iteration builds here a geometry from a conceptual object; still should it be perceived as such! Privileged by its nature, the observer is well linked to the singularity QM][GR, as well as to the report time][space.

References:

- [7] C. J. Bordé - "Base units of the SI, fundamental constants and modern quantum physics" 2004 <http://alainconnes.org/docs/bordeunits.pdf> page 2185
- [8] Pierre Fayet - "À propos des unités fondamentales, notamment des unités électriques" 2007 http://www.metrodiff.org/docs/rapport_groupe_de_travail_dec07-1.pdf Annex 6, page 25
- [9] Planck units https://en.wikipedia.org/wiki/Planck_units
- [10] Fine-structure constant https://en.wikipedia.org/wiki/Fine-structure_constant
- [11] Alain Connes - "La réalité mathématique archaïque", interview by Olivier Postel-Vinay - 2000 <https://www.larecherche.fr/>, N°332 pages 109-111
- [12] Denis Collin - "L'incommensurable" <http://denis-collin.viabloga.com/news/l-incommensurable>
- [13] Rafael D. Sorkin, Syracuse University - "Geometry from order: https://www.einstein-online.info/en/spotlight/causal_sets/
- [14] Malament David B. "The class of continuous timelike curves determines the topology of spacetime" 1977 <https://aip.scitation.org/doi/10.1063/1.523436>
- [16] Mirror symmetry [https://en.wikipedia.org/wiki/Mirror_symmetry_\(string_theory\)](https://en.wikipedia.org/wiki/Mirror_symmetry_(string_theory))
- [17] Noether's theorem https://en.wikipedia.org/wiki/Noether%27s_theorem