



**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-02391730v2

**HAL Id: hal-02391730**

**<https://hal.science/hal-02391730v2>**

Preprint submitted on 23 Jul 2020

**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 builds 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

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  $\tau = 2\pi$ ) and  $\pi$ , just like 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][ $1 = \epsilon_0\mu_0c^2$  and  $\pi$ , just like the observer, is on the surface of the paradox.

$\varphi$ ,  $\pi$ ,  $e$  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 substance to the information.

Christian J. Bordé, a member of the French Academy of Sciences, writes about the fine structure constant: "It should be possible to describe the whole of electromagnetism 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, also a member of the Academy, specifies : "The charge of the electron is a quantity both measured and dimensionless ... The coulomb is a unit of electric charge derived from the mechanical and even geometric units, while of course also being dimensionless" [8].

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

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

The Planck units [9] are defined from 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 with common ratio  $c$ , the speed of light. As alpha 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 vacuum" [10], we have one-all: "A very simple structure is not incompatible with the inexhaustible character of the information contained in physics as well as in mathematics." A.Connes [11]

## 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 inevitably from the imbalance of the attributes of the faces of the mirror which remains one. The resulting information, intrinsically an interaction, is both absence and presence of limits, of dimensions. The relativity of the observation is thus the effect of the severe constraints of the coupling and of its constancy on the attributes both imaginary and real of this knot.

"Isn't the incommensurable in general that which evades reason or what reason cannot account for since reason as ratio is first of all an ability to relate things? This would suggest that *reason* and *measure* are not only linked, but related"[12]. The fine structure of this mirror is a constant both *report* and *number* which generates the elementary wave][corpuscle duality ; this ratio is also that of their movement.

Let us take  $@ = f(\alpha)$ , this quantum of interaction associated with space/time, the *geometry* of the observer; @ is at the center of the interlacing, according to the slogan "*order+number=geometry*"[13] taking into account the theorem of David Malament [14]. At the Planck scale its transformations, inherited from the attributes of the knot, loop in an iterative mode.

**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  $@ = f(\alpha)$ , time and the Planck length, since  $@ = q^2/10^7 = ml/c^0 = \hbar/c^1 = Gm^2/c^2$ . It is an economy of means [15] sealed by the Noether's theorem [16].**

$$\begin{array}{ccc}
 ml = C^0 & & C^1 = \hbar \\
 & \times & \\
 & @ & \\
 & \times & \\
 & C^2 & \\
 & = Gm^2 & 
 \end{array}$$

Conceivable spins : (0, 1/2, 1, 2 ) [17] for (@, ml,  $\hbar$ ,  $Gm^2$ ) :

"the corresponding geometric nature of the iterative steps is in the respective order of iterations: scalar geometry, spinor geometry, vector geometry, symmetric tensor geometry "[18].

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 signified [particle, action, gravitation]. Iteration builds in this model a geometry from a conceptual object, though it needs to be perceived as such! Privileged by his nature, the observer is indeed linked to the QM][GR singularity, as well as to time][space couple.

## Reflection

- $q^2$  in reference to the Cooper pairs?
- To say that mass deforms space-time which is energy ( $\acute{\epsilon}\nu\acute{\epsilon}\rho\gamma\epsilon\iota\alpha$ , force in action) would be to say that mass is deformation of space-time ( $Gm=lc^2$ ).  $Gm^2$  would be a quantum.
- The Higgs, the only scalar particle of the standard model, could have an affinity with the joker @.

## References

[1,2,3,4,5] Screenshots

<https://drive.google.com/file/d/1vxgS2iHgvCaI7kEyq0NYSq1dTUyBZmZD/view?usp=sharing>

[7] Christian 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](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](https://en.wikipedia.org/wiki/Planck_units)

[10] Fine-structure constant [https://en.wikipedia.org/wiki/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/](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>

[15] Mirror symmetry [https://en.wikipedia.org/wiki/Mirror\\_symmetry\\_\(string\\_theory\)](https://en.wikipedia.org/wiki/Mirror_symmetry_(string_theory))

[16] Noether's theorem [https://en.wikipedia.org/wiki/Noether%27s\\_theorem](https://en.wikipedia.org/wiki/Noether%27s_theorem)

[17] Spin <https://fr.wikipedia.org/wiki/Spin>

[18] Private communication from Frédéric Élie <http://fred.elie.free.fr/>