

# Reinventing Quantum Physics

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## Abstract

Quantum Physics (QP) was invented in the early years of the Twentieth century by physicists born and educated in the western world. We examine the possibility that this is the main reason—or at least one of the main reasons—which caused QP to go astray from the start. We present the ABC for a renovated Quantum Physics.

## Keywords

Quantum Physics, Motion, Energy, Equations, Maat

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## 1. Introduction

One question currently haunts the minds of physicists around the world whatever their fields of expertise might be—aerospace science, computational mathematics, operations research, astronomy, astrophysics, quantum physics.... It arises as follows.

As human beings we experience the irresistible certainty of living (existing) in a world composed of four constitutive ingredients: space, time, matter and energy. To us, furthermore, space has three dimensions—width, height and depth—, time flows evenly in one dimension—yesterday, today, tomorrow—. Matter is made up of molecules, themselves made up of atoms, themselves made up of “elementary particles”, themselves made up of...

Of what?

Of points. Points, whatever they are, seem to be the ultimate fabrics of the universe—the cosmos, the System of the World, call it as you wish—our world.

What about *energy*?

It seems to exist in the universe in two distinct forms: “ordinary energy” and “dark energy”.

Dark energy? What is it, where is it, and why is it “dark”...?

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We examine these three disturbing questions in this note.

## 2. The Problem with Dark Energy

Behind the appearances noted above, lies of course the mysterious world of the “quantum”.

Quantum Physics (QP) was invented in the early years of the twentieth century by physicists born and educated in the western world. They were taught to write the equations which occur in their calculations so as to be read *from left to right*, as for example this (modest) equation

$$1 \times 1 = 1. \quad (1a)$$

Ancient Egyptians had more imagination. Their hieroglyphic inscriptions can be read from left to right, but also, for some of them, from right to left, or from top to bottom or bottom to top (**Figure 1**).

To proceed further along this line of reasoning, we placed ourselves under the protection (the guidance) of the Goddess Maat said to have regulated the stars, the seasons, and the actions of mortals and deities in Ancient Egypt, and to have set the order of the universe from chaos at the moment of creation—precisely a question we investigated in preceding notes.

By Egyptian conventions, when Maat looks to her right as in **Figure 1(a)**, she expects to be approached from the left. We approached her from the left and we presented her with our Equation (1a) as a playful riddle.

She inspected the riddle and told us with an inquisitive smile on her face (our interpretation, our translation): “Written as you have written it, your riddle expresses a modest arithmetic “truth” of the kind that a well-trained elementary western world school-teacher might want to transmit to the young children he/she has the charge of educating

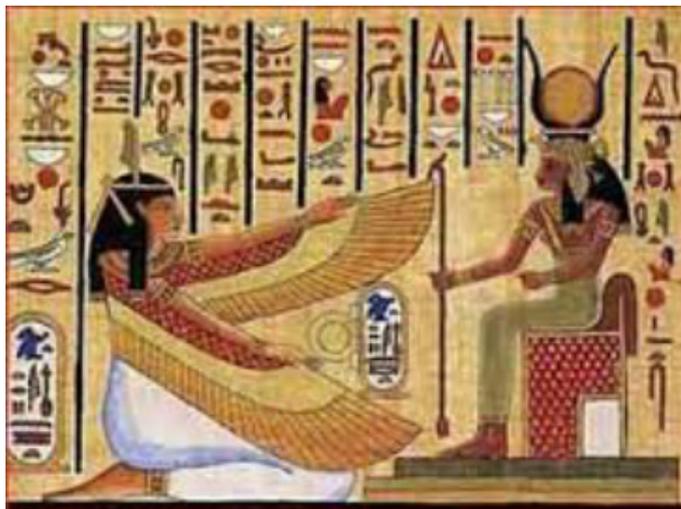
We returned to Maat the next day. To our surprise, she was looking to her left this time, (to the right for us as on **Figure 1(b)**). She told us, again with a friendly greeting smile: “Do you remember the riddle you presented to me yesterday?” We said, yes we remembered it. She said: “Now read the riddle from right to left.” We did. And we felt frustrated. What we saw—when converted visually to our usual way of reading in the western world, *i.e.* left to right—was:

$$1 = 1 \times 1, \quad (1b)$$

Maat said: “Do not feel frustrated. Written this way the riddle now says that the entity “1” is a “composite”—here is the “product”—of two “units”, a statement more “philosophical” than the one you (we) derived from the riddle yesterday.”

We were startled!

And even more so when Maat added with a serious look on her face: “And seize this opportunity to put an end to your use, abuse and misuse in your writings of the word *quantum*.”



**Figure 1.** How to read hieroglyphic inscriptions.

<http://emmahardieancientcivilisations.weebly.com/uploads/3/0/3/6/30367743/4814950.jpeg?1403579135>.



Figure 1(a). Maat looks to her right when she expects to be approached from the left (her right).  
<https://sp.yimg.com/ib/th?id=JN.WMQRtes99bTyXuuZQDXrMw&pid=15.1&P=0>



Figure 1(b). Maat looks to her left when she expects to be approached from the right (her left).  
<https://sp.yimg.com/ib/th?id=JN.WMQRtes99bTyXuuZQDXrMw&pid=15.1&P=0>

We received this “order” from Maat as an injunction. Keeping in mind that an injunction is “an equitable remedy in the form of a court order that compels a party to do or refrain from specific acts” we decided to comply with it at once without further ado.

### 3. A Huge Problem

We collected the information available concerning the current use of the word *quantum* in theoretical physics. We came up with this short list.

- 1) Energy in the the universe is not “quantized”. Motion is.
- 2) Motion occurs in nature in the form of elements each carrying the same amount, the same quantity—the same *quantum*—of motion. NB In this statement we substituted the word *motion*, easily understood, for the word *action* formally used in this context but largely ignored by physicists at large, one of them Albert Einstein, who throughout his life throroughly ignored its use and introduced instead the faulty concept of “energy quanta”.
- 3) As suggested by French mining engineer genius mathematician Henri Poincaré shortly before his premature death in 1912, the motion element—the *quantum*—contains *points* ”which are equivalent to one another from the standpoint of probability”, said Poincaré [1].

This raises a huge problem: Poincaré tells us that the motion element—the *quantum*—contains points. Now if the quantum contains points, whatever they might be, how does it maintain its integrity? This would be like trying to keep together as a unit a group of tourists visiting some shrine abroad!

We had to find a way out.

We searched... and came up with this solution.

### 4. Toward a Solution

To describe the hidden functioning of the quantum in the System of the World, we developed a theoretical scheme in the framework of which, when written western style, two of the fundamental equations read [2]:

$$lp = Ed = h. \tag{2a}$$

Never mind at the moment what the symbols these equations contain represent. If, instead of being read left to right these equations are read right to left (but printed left to right so as to be read “normally” by western physicists), they would read

$$h = dE = pl. \tag{2b}$$

Let us explore their meaning when written this way.

### 5. What to Do When You Meet an Unknown

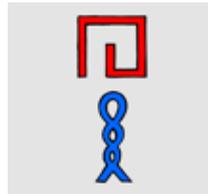
Arab scholars imported to the territories they had conquered on the Spanish Peninsula during the Middle Age their practice of *algebra* (“*al-jabr*”, to them) meaning “reunion of broken parts”. It allowed them to convert typically an equation such as  $3 - 1 = 2$  into  $3 = 2 + 1$ , thereby reuniting the “broken parts”. To represent an unknown entity in this art, they used, not a graphic, but a “sound”, which became the sound of the Greek letter  $\chi$  and finally the Latin letter  $x$  that we still use today to designate the unknown in an algebraic equation.

Let us call “ $x$ ” instead of “ $h$ ” the unknown value that the composites  $lp$  and  $Ed$  have in common according to Equations (2b). These equations now read

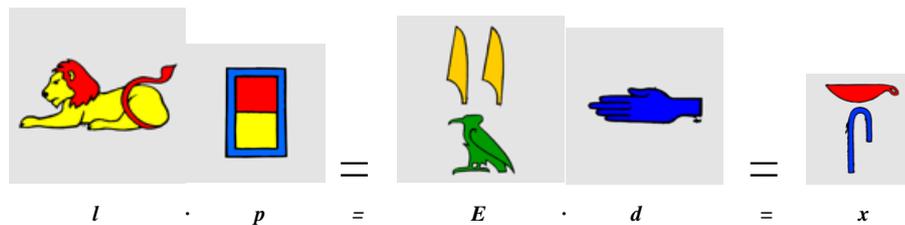
$$x = lp \tag{2c}$$

$$x = Ed$$

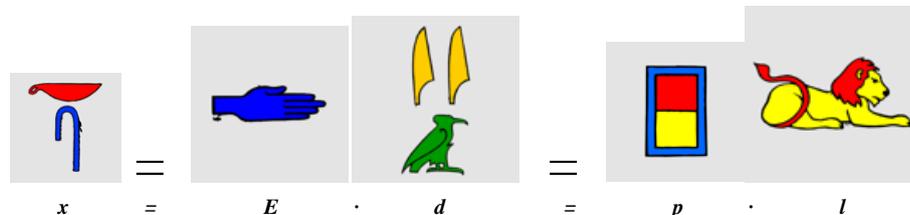
For the sake of curiosity, which sometimes is a key to discovery, let us use an Egyptian hieroglyph to represent this common value, for example the hieroglyph:



which suggests some form of question mark, some form of ambiguity, of perplexity—of uncertainty, of *inquisitiveness*. And while we are at it... let us write Equations (2c) using hieroglyphs throughout, an easy task since a well-defined hieroglyph exists for each of the four letters,  $l$ ,  $p$ ,  $E$  and  $d$  the equations contain. We show the result in **Figure 2(a)** and **Figure 2(b)**.



**Figure 2(a).**  $lp = Ed = x$  written with hieroglyphs read left to right.  
[http://www.artyfactory.com/egyptian\\_art/egyptian\\_hieroglyphs/images/icons/l.gif](http://www.artyfactory.com/egyptian_art/egyptian_hieroglyphs/images/icons/l.gif)



**Figure 2(b).**  $lp = Ed = x$  written with hieroglyphs read right to left.  
[http://www.artyfactory.com/egyptian\\_art/egyptian\\_hieroglyphs/images/icons/l.gif](http://www.artyfactory.com/egyptian_art/egyptian_hieroglyphs/images/icons/l.gif)

We remembered one significant word of the English language not often used. A statement is said to be *informative* if it expresses a proposition containing just one alternative possibility. General Relativity, for instance, is an informative theory: it asserts that gravitation results from curvatures induced by matter and energy in a 4-dimensional spacetime. It asserts something... which is not necessarily “true”. By contrast, when properly understood, Equations (2c) constitute an *inquisitive* statement—they express a proposition containing two or more alternative possibilities.

All this having been said and attempted let us affront without further delay the moment of truth.

## 6. Reformulating Quantum Physics

### 6.1. Discard the Symbol $h$ Representing the Planck Constant

The systematic misuse and abuse by physicists of the symbol  $h$  ever since its invention by Max Planck in 1900 to represent the elementary quantum of action in equations have made of this “constant” a handicap for the sane development of Quantum Physics. Let us respectfully place it in the Quantum Museum of Obsolete Concepts, the QMOC.

Incidentally, as we have shown in a preceding note [2], Albert Einstein himself made a valiant effort to get rid of the Planck constant in the first major paper he wrote during his *Annus mirabilis* (1905) [3]. This is not a loss anyway since this “constant” is not a constant in the strict sense of the word and cannot legitimately enter as a factor in algebraic equations.

### 6.2. Acknowledge the Quantum as Being a Ubiquitous Active Principle

Understood to constitute a (mathematical) statement describing a *physical* reality, Equations (2c) tell us that the (physical) entity represented by the symbol  $x$  can express itself, or be expressed, in the form of at least two composites,  $lp$  and  $Ed$ . This confers to this entity the character of *inquisitiveness*: one question, at least two different answers. *Inquisitive*: they can be read from left to right, we call the  $x$  as representing the *Xon*, or from right to left, we call it as representing the *noX*. We now claim that *inquisitive*, the quantum is also *ubiquitous* (from the Latin *ibique*, meaning “everywhere”), *i.e.* it is or seems to be everywhere at the same time—it is *omnipresent* in French, *ubicuo* in Spanish, *alomtegenwoordig* in Dutch, 无处不在 in Chinese, *вездесущий* in Russian (Figure 3).

As it “expresses itself”—as it “occurs”—in the System of the World (the Void; nature, the cosmos) the *Xon/noX* quantum generates (liberates) continuously, but discontinuously, points—shall we call them *quanta*?

Returning to our starting point in this note, we are now ready to place the cherry on the cake (Figure 4).



Figure 3. An inquisitive ambiguous ubiquitous active principle runs the System of the World. [https://encrypted-tbn2.gstatic.com/images?q=tbn:ANd9GcO-vcqN2rvO-ameh9LjazpBy8jmHMBjDL3NqxrHTeFYwn6fny8\\_kw](https://encrypted-tbn2.gstatic.com/images?q=tbn:ANd9GcO-vcqN2rvO-ameh9LjazpBy8jmHMBjDL3NqxrHTeFYwn6fny8_kw)



Figure 4. The cherry on the cake. The fallacious Planck constant is gone. <http://www.devotedtocakes.ie/wp-content/uploads/2014/02/Chinese-New-Year-Cake.jpg>

### 6.3. Place the Cherry on the Cake

By the scheme exposed in this note, the quantum expresses itself in the System of the World by generating in the Void composites of the form  $ab$ , with  $a$  and  $b$  forming, as of this writing, four known possible combinations [2]:

$$x = lp, Ed, \varphi\sigma \text{ and / or } e\chi$$

where

- $l$  measures a fractal space length,
- $p$  a linear momentum,
- $E$  an energy lasting for a time duration  $d$ ,
- $\varphi$  measures an angle,
- $\sigma$  the conjugate angular momentum,
- $e$  an (electromagnetic) charge and
- $\chi$  the corresponding (mysterious) gauge function.

This being, we see that the quantum—the Xon/noX—generates in the Void the ingredients constitutive of space, momentum, energy, time and more.

### 7. Conclusions

Interestingly, what we reported in this note coincides with the contents and the spirit of statements formulated recently by one of us [4]—using a more complex vocabulary—stating for example: “The preceding explanation amounts to a paradigm shift in physics where the *totally empty vacuum* of spacetime is taken as fundamental and everything else is *derivable from it*”, or “*All forms of energy and matter* represented by [the] iconic equation  $E = mc^2$  are nothing but the zero point energy *fluctuations* of the real *vacuum* of spacetime” (our emphasis).

And so, where is dark energy located in the universe?

As per the reasonings developed in the present note, energy—be it *ordinary* or *dark*—is generated randomly and discontinuously in the Void by the quantum. And thus, in this sense, it is fair to say that “the Phantom (energy, ordinary and dark) is in the House”—and it is not constituted of “energy quanta”.

### Acknowledgements

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