**(March 2019) UNBELIEVALBE similar ideas, UNBELIEVABLE similar framework of the article on “quantum mechanics” written by Proietti et al (2019) with my EDWs (2002-2008)**

**Gabriel Vacariu**

**The article that I investigate in this section is**

**(2019) Experimental rejection of observer-independence in the quantum world**

Massimiliano Proietti,1 Alexander Pickston,1 Francesco Graffitti,1 Peter Barrow,1

Dmytro Kundys,1 Cyril Branciard,2 Martin Ringbauer,1, 3 and Alessandro Fedrizzi1

at

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In the article written by Proietti et al. (2019), there are UNBLELIEVABLE similar ideas to my ideas (2002-2008); in fact, the framework of this article seems UNBELIEVABLE similar to my framework, the EDWs perspective!!!! I applied my EDWs to quantum mechanics (getting micro-EW, wave-EW), to Einstein’s special relativity getting EDWs for those two observers (one in the train and one on the pavement), to microparticles and macro-objects (EDWs), etc.

The authors of this article work in an UNBELIEVABLE similar framework (see below details), and applied this framework to quantum mechanics referring to the relationship between two observers and the microparticle. In this way, they get EDWs for the same microparticle. However, I have done exactly the same application to Einstein’s special relativity. I emphasize that it would be necessary my EDWs to apply this framework to the same particle. In my book 2014, if the reader replaces the macro-objects with the microparticle, there would obtain exactly the EDWs for the microparticle that can be found in this article! Amazing it is the fact that the authors, having no background in philosophy and having no new theory on quantum mechanics, have discovered the existence of **observer-independent “facts of the world” (that are exactly my EDWs!!!).** Obviously, the authors are geniuses like sean carroll, markus Gabriel, carolo rovelli, and so many from my manuscript referring to UNBELIEVABLE similarities (see the bibliography at the end of this article!)

I investigated some paragraphs of this article below:

**(2019) Experimental rejection of observer-independence in the quantum world**

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The scientific method relies on facts, established through repeated measurements and agreed upon

universally, independently of who observed them. In quantum mechanics, the objectivity of observations is not so clear, most dramatically exposed in Eugene Wigner’s eponymous thought experiment where two observers can experience fundamentally different realities. While observer-independence has long remained inaccessible to empirical investigation, recent no-go-theorems construct an extended Wigner’s friend scenario with four entangled observers that allows us to put it to the test. In a state-of-the-art 6-photon experiment, we here realise this extended Wigner’s friend scenario, experimentally violating the associated Bell-type inequality by 5 standard deviations. This result lends considerable strength to interpretations of quantum theory already set in an observer-dependent framework and demands for revision of those which are not.

The friend can even tell Wigner that she recorded a definite outcome (without revealing the

result), yet Wigner and his friend’s respective descriptions remain unchanged [6]. This calls into question the objective status of the facts established by the two observers.

Can one reconcile their different records, or are they fundamentally incompatible—so that they cannot

be considered **objective**, **observer-independent “facts of the world”** [3, 4]?

[Obviously, these “**objective**, **observer-independent “facts of the world’ ”** sends directly to the EDWs!!!! What else it would mean “objective” in this expression????]

It was recently shown [4] that this question can be

addressed formally, by considering an extension of the

Wigner’s friend scenario as follows. Consider a pair of

physical systems, shared between two separate laboratories

controlled by Alice and Bob, respectively, see Fig. 1c.

Inside these laboratories, Alice’s friend and Bob’s friend

measure their respective system non-destructively and

record the outcomes in some memory. Outside these laboratories,

in each run of the experiment Alice and Bob

can choose to either measure the state of their friend’s

record—i.e. to attest the “facts” established by their

friend, and whose results define the random variables A0

(for Alice’s friend) and B0 (for Bob’s friend); or to jointly

measure the friend’s record and the system held by the

friend—to establish their own “facts”, defining variables

A1 (for Alice) and B1 (for Bob). After comparing their

results, Alice and Bob can estimate the probability distributions

P(Ax;By) for all four combinations of x; y = 0; 1.

As in the original Wigner’s friend Gedankenexperiment,

the facts A1;B1 attributed to Alice and Bob and A0;B0

attributed to their friends’ measurements may be inconsistent.

**This raises the question whether a more general framework**

**exists in which all observers can reconcile their**

**recorded facts.**

[This observation sends directly to my EDWs and not to Wigner’s approach!!! In my books, I indicated exactly this state of affair: it is not only about the EDWs of the wave and the particle, but also the EDWs of each observer. However, I applied this strategy also to Einstein’s special relativity – see my book 2014!]

If this is the case (assumption O,

observer-independent facts, stating that a record or piece

of information obtained from a measurement should be a

“fact of the world” that all observers can agree on), and

under the additional assumptions that Alice and Bob can

freely choose their measurements A0;A1 and B0;B1 (assumption

F, free-choice), and that their choices do not influence each others outcome (assumption L, locality),

then it should be possible to construct a single probability

distribution P(A0;A1;B0;B1) for the four individual

facts under consideration, whose marginals match the

probabilities P(Ax;By) [3, 4]. (p. 2)

[what does it mean “fact of the world”???? of course it is about EDWs, but the authors cannot introduce this notion! Otherwise, there would be possible for me to accuse them of plagiarizing my ideas, but of course I suppose they have not read any of my work, did they?]

In contrast to standard Bell inequalities, Eq. (2) is not

concerned with the coexistence of local properties for two

separate physical systems, but rather with the coexistence

of facts with respect to different observers. (p. 2)

[This mean clearly EDWs!!!]

As shown in Refs. [3, 4], a violation of the inequality

above is however possible in a physical world described

by quantum theory. Such a violation would demonstrate

that the joint probability distribution P(A0;A1;B0;B1)

is incompatible with assumptions F, L, and O. Therefore,

if we accept F and L, it follows that the pieces of information

**corresponding** to facts established by Alice, Bob

and their friends cannot coexist within a single, observerindependent

framework [3, 4].

[Corresponding is the main notion in my EDWs perspective! This idea involves, of course, the rejection of the “world” and its replacement with objective

it with EDWs!!!]

Notably this is the case

even though Alice and Bob can acknowledge the occurrence

of a definite outcome in their friend’s closed laboratory.

We note that, although Bell’s mathematical machinery

[9] is used to show the result, the set of assumptions

considered here—and therefore the conclusions that

can be drawn from a violation of inequality (2)—are different

from those in standard Bell tests.

[The sentences that follow – referring to the notion of “observer/interaction” - seems to be taken from my works!!!! I made this identification in my first works 2002-2005!!!! In my article 2006, I applied these notions to quantum mechanics!!!!]

Before we describe our experiment in which we test

and indeed violate inequality (2), let us first clarify our

notion of an observer. Formally, an observation is the act of extracting and storing information about an observed

system. Accordingly, **we define as observer any physical**

**system that can extract information from another**

**system by means of some interaction**, and store that information

in a physical memory. Such an observer can

establish “facts”, to which we assign the value recorded in

their memory.

[It would mean EDWs!!!!!]

Notably, the formalism of quantum mechanics

does not make a distinction between large (even

conscious) and small physical system, which is sometimes

referred to as universality. **Hence, our definition covers**

**human observers, as well as more commonly used nonconscious**

**observers such as (classical or quantum) computers**

**and other measurement devices—even the simplest**

**possible ones, as long as they satisfy the above requirements.** (pp 2-3)

[Exactly these ideas appear in my works word by word! However, these ideas are available only within the EDWs and not the “world/Universe”! this is the reason the authors of these article introduce “facts of the world” that are EXACTLY my EDWs!!!!!]

Discussion.— In principle, “Bell-Wigner tests” like

ours are subject to similar loopholes as tests of conventional

Bell inequalities [15]. To address the detection

and space-time loopholes, we make the physically reasonable

assumption of fair sampling and rely on the empirical

absence of signalling between our measurement

devices (which experimentally we verified to be in agreement

with the expectation from Poissonian statistics), respectively.

[“space-time loopholes”??? I emphasize that in my book 2016, I indicated that spacetime do not exist. What does it mean “space-time loopholes”???]

Another loophole may arise if the observables

A0;B0 that are measured in practice do not strictly **correspond**

to a measurement of the friends’ memories.

[The word “correspondence” is the main concept in my EDWs!!!!]

Here

we assume (with reasonable confidence, up to negligible

experimental deviations) that the measured observables

indeed factorise as in Eq. (4), with the identity on the

photon system, so that the above interpretation for A0,

B0 can be trusted. As discussed in the Supplementary

materials, closing all loopholes in full will be considerable

more challenging than for Bell tests.

One might further be tempted to deny our photonic

memories the status of “observer”. This, however, would

require a convincing revision of our minimal definition

of what qualifies as an observer, **which typically comes**

**at the cost of introducing new physics that is not described**

**by standard quantum theory.**

**[of course, my EDWs perspective is a new Physics!!!]**

Eugene Wigner,

for example, argued that the disagreement with his hypothetical

friend could not arise due to a supposed impossibility

for conscious observers to be in a superposition

state [2]. However, the lack of objectivity revealed by a

Bell-Wigner test does not arise in anyone’s consciousness,

but between the recorded facts. Since quantum theory

does not distinguish between information recorded in a

microscopic system (such as our photonic memory) and

in a macroscopic system the conclusions are the same for

both: the measurement records are in conflict regardless

of the size or complexity of the observer that records

them.

[again, we have here exactly EDWs: the micro-EW, the wave-EW, the macro-EW!!!!!! – see my works since 2002-2008 and later with all these ideas, word by word!!!!!]

Implementing the experiment with more complex

observers would not necessarily lead to new insights into

the specific issue of observer-independence in quantum

theory. It would however serve to show that quantum

mechanics still holds at larger scales, ruling out alternative

(collapse) models [16]. However, this is not the point

of a Bell-Wigner test—less demanding tests could show

that.

Modulo the potential loopholes and accepting the photons’

status as observers, the violation of inequality (2)

implies that at least one of the three assumptions of free

choice, locality, and observer-independent facts must fail.

Since abandoning free choice and locality might not resolve

the contradiction [5], one way to accommodate our

result is by proclaiming that “facts of the world” can

only be established by a privileged observer—e.g., one

that would have access to the “global wavefunction” in

the many worlds interpretation [17] or Bohmian mechanics

[18]. Another option is to give up observer independence

completely by considering facts only relative to

observers [19], or by adopting an interpretation such as

QBism, where quantum mechanics is just a a tool that

captures an agent’s subjective prediction of future measurement

outcomes [20]. This choice, however, requires

us to embrace the possibility that different observers irreconcilably

disagree about what happened in an experiment. (p. 4)

[again, the last sentence indicates exactly my EDWs!!!!

**CONCLUSION: The main ideas of these article can be found in my works (2002-2008). The main framework of this article is UNBELIEVABLE similar to my EDWs perspective!!!!**  **Does the reader want more? Go and read my works 2002-2005-2006-2008!!!!! I emphasize that Wigner, Bohn, Bell, Everett, Heisenberg, and all others people from physics (including sean carroll, carlo rovelli, etc. see their works investigated by me in my manuscript referring to UNBELIEVALBE similarities, on Internet – Academy.edu, Researchgate, etc.) until today have been working within the wrong framework, the “world”/”Universe” or as I called, the “unicorn world”!]**

**[Below an article in which Weinberger explains the above article]**

**More Than One Reality Exists (in Quantum Physics)** By [Mindy Weisberger, Senior Writer](https://www.livescience.com/authors/?name=Mindy%20Weisberger)| March 20, 2019 07:00am ET

<https://www.livescience.com/65029-dueling-reality-photons.html?fbclid=IwAR1uR89mEP9MLZmlgLx9OkgvCrLRxZw56BeBJl94mIn5dFn-_hCt0rcc7k4>

Can two versions of reality exist at the same time? Physicists say they can — at the quantum level, that is.

Researchers recently conducted experiments to answer a decades-old theoretical physics question about dueling realities. This tricky thought experiment proposed that two individuals observing the same photon could arrive at different conclusions about that photon's state — and yet both of their observations would be correct.

For the first time, scientists have replicated conditions described in the thought experiment. Their results, published Feb. 13 in the [preprint journal arXiv](https://arxiv.org/pdf/1902.05080.pdf), confirmed that even when observers described different states in the same photon, the two conflicting realities could both be true. [[The Biggest Unsolved Mysteries in Physics](https://www.livescience.com/34052-unsolved-mysteries-physics.html)]

[of course, it is about my EDWs!!!!]

"You can verify both of them," study co-author Martin Ringbauer, a postdoctoral researcher with the Department of Experimental Physics at the University of Innsbrück in Austria, told Live Science.

## Wigner's friend

This perplexing idea was the brainchild of Eugene Wigner, winner of the Nobel Prize for Physics in 1963. In 1961, Wigner had introduced a thought experiment that became known as "Wigner's friend." It begins with a photon — [a particle of light](https://www.livescience.com/63616-photons-before-after.html). When an observer in an isolated laboratory measures the photon, they find that the particle's polarization — the axis on which it spins — is either vertical or horizontal.

However, before the photon is measured, the photon displays both polarizations at once, as dictated by the laws of quantum mechanics; it exists in a "superposition" of two possible states.

[of course, the “superpostion” is a wrong notion within the “world” (i.e., the unicorn world); therefore the authors need to introduce, in their words, observer-independent “facts of the world”, i.e., my EDWs!!!!!!]

Once the person in the lab measures the photon, the particle assumes a fixed polarization. But for someone outside that closed laboratory who doesn't know the result of the measurements, the unmeasured photon is still in a state of superposition.

That outsider's observation — their reality — therefore diverges from the reality of the person in the lab who measured the photon. Yet, neither of those conflicting observations is thought to be wrong, [according to quantum mechanics](https://www.livescience.com/26444-quantum-mechanics-physicists-poll.html).

[Of course, within the unicorn world, there would be strong ontological contradictions! I resolved all these ontological contradictions in my works 2002-2006-2008!!!!]

## Altered states

For decades, Wigner's mind-bending proposal was just an interesting thought experiment. But in recent years, [important advances in physics](https://www.livescience.com/59810-quantum-teleportation-record-shattered.html) finally enabled experts to put Wigner's proposal to the test, Ringbauer said.

"Theoretical advances were needed to formulate the problem in a way that is testable. Then, the experimental side needed developments on the control of quantum systems to implement something like that," he explained.

Ringbauer and his colleagues tested Wigner's original idea with an even more rigorous experiment which doubled the scenario.

[really their “original idea”???? I don’t believe it is “original”!!!!]

They designated two "laboratories" where the experiments would take place and introduced two pairs of entangled photons, meaning that their fates were linked, so that knowing the state of one automatically tells you the state of the other. (The photons in the setup were real. Four "people" in the scenario — "Alice," "Bob" and a "friend" of each — were not real, but instead represented observers of the experiment).

The two friends of Alice and Bob, who were located "inside" each of the labs, each measured one photon in an entangled pair. This broke the entanglement and collapsed the superposition, meaning that the photon they measured existed in a definite state of polarization. They recorded the results in quantum memory — copied in the polarization of the second photon.

Alice and Bob, who were "outside" the closed laboratories, were then presented with two choices for conducting their own observations. They could measure their friends' results that were stored in quantum memory, and thereby arrive at the same conclusions about [the polarized photons](https://www.livescience.com/63616-photons-before-after.html).

But they could also conduct their own experiment between the entangled photons. In this experiment, known as an interference experiment, if the photons act as waves and still exist in a superposition of states, then Alice and Bob would see a characteristic pattern of light and dark fringes, where the peaks and valleys of the light waves add up or cancel each other out. If the particles have "chosen" their state, you'd see a different pattern than if they hadn't. Wigner had previously proposed that this would reveal that the photons were still in an entangled state.

The authors of the new study found that even in their doubled scenario, the results described by Wigner held. Alice and Bob could arrive at conclusions about the photons that were correct and provable and that yet still differed from the observations of their friends — which were also correct and provable, according to the study.

[Quantum mechanics](https://www.livescience.com/37807-brain-is-not-quantum-computer.html) describes how the world works at a scale so small that the normal rules of physics no longer apply; over many decades, experts who study the field have offered numerous interpretations of what that means, Ringbauer said.

[In my book from 2008, (that it is my PhD thesis from UNSW, Sydney, Australia that can be found on internet at the university page posted FREE by the staff from this university in 2007!!!]

However, if measurements themselves aren't absolutes — as these new findings suggest — that challenges the very meaning of quantum mechanics.

[really? I have changed QM long time ago!!! See the footnote about quantum mechanics in my article 2005 (dedicated on the mind-brain problem) from Synthese journal (USA), one of the best philosophical journal in the world!!!]

"It seems that, in contrast to classical physics, measurement results cannot be considered absolute truth but must be understood relative to the observer who performed the measurement," Ringbauer said.

[Again, of course, my EDWs!!!]

"The stories we tell about quantum mechanics have to adapt to that," he said.

[Indeed, the adaption to EDWs!!!!!]

**Bibliography**

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