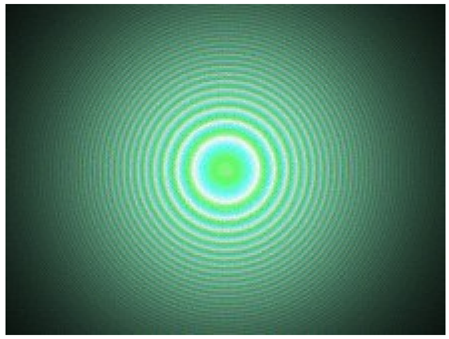
# One Thing is Certain: Heisenberg's Uncertainty Principle is Dead



*by Miles Mathis*

A few months ago (January 15, 2012), *Scientific American* ran an article called "One Thing is Certain: Heisenberg's Uncertainty Principle is not Dead." Unfortunately, the content of their own article proved the opposite.

This is what we have come to expect from the mainstream media, in all arenas and all subjects: poorly disguised propaganda. They hardly even bother to hide data from you, they are so confident they can tell you what to think just with a title and summation. They show you data that disproves A, they admit that A has been disproved, but then somehow—miraculously—they spin this as a great confirmation of A. You believe the title and the soaring music and the violins. You don't believe the data.

Even the subtitle contradicts the title:

Experimenters violate Heisenberg's original version of the famous maxim, but confirm a newer, clearer formulation.

If experimenters violated Heisenberg's version, then that version is dead, no? The "newer" version is that of Earle Kennard, from 1927—which is not much newer (same year). And *Scientific American* admits,

[Kennard's version] says that you cannot suppress quantum fluctuations of both position $\sigma(q)$ and momentum $\sigma(p)$ lower than a certain limit simultaneously. The fluctuation exists regardless [of] whether it is measured or not, and the inequality does not say anything about what happens when a measurement is performed. Kennard's formulation is therefore totally different from Heisenberg's.

There it is in plain English, in their own article: Kennard's version does not say anything about measurement and is totally different from Heisenberg's. Therefore, even if Kennard's version is allowed to stand, Heisenberg's version is overturned. According to the logic of this article, the principle should be renamed the Kennard Fluctuation Principle or something.

This is also very curious:

The [version] that physicists use in everyday research and call Heisenberg's uncertainty principle is in fact Kennard's formulation. It is universally applicable and securely grounded in quantum theory. If it were violated experimentally, the whole of quantum mechanics would break down. Heisenberg's formulation, however, was proposed as conjecture, so quantum mechanics is not shaken by its violation.

Beg pardon? The whole of quantum mechanics has rested on Kennard's principle for 85 years, and yet no one has heard of him? Heisenberg's formulation was just a conjecture, and quantum mechanics is not shaken by its violation? **That's not what we have been indoctrinated with for eight lousy decades!** Is no one else shocked by the misdirection here? This is a psy-op, meant to test your sanity. It is meant to test how brainwashed the public really is. "Can we tell just tell them this, and they will believe it? Surely not." "Yes, they will believe anything. You could tell them it was night while the Sun was shining in their faces."

What this means is that the mainstream aren't going to change their theories and their sales pitches no matter what new data comes in. They are going to continue to shove the old dogma down your throat regardless, because they can't be bothered to change the texts, or even the names. They have just admitted that the HUP was conjecture, has been violated, and is basically now no more than a worthless pile of words. But will that divert them at all from their path? As we see here, the answer is no. They will just tweak a few footnotes and go on as if nothing happened. They have been doing that for decades. Heisenberg will continue to be the poster boy, and quantum mechanics will continue to be the greatest thing since sliced bread, confirmed by all data.

Why are they doing this? They even tell you that in the article:

What Einstein's $E=mc^2$ is to relativity theory, Heisenberg's uncertainty principle is to quantum mechanics—not just a profound insight, but also an iconic formula that even non-physicists recognize.

They can't let the Heisenberg uncertainty principle go, and that is why. It is too big a piece of the public relations kit. Although they show in the article that the HUP is *not* a profound insight—remember, they just said it was conjecture, and that nothing really rested on it—they have to keep it because it is iconic. More than that, it is scripture. You don't jettison scripture just because it has been proven false. You work it into the new myth. You spin it. You whitewash it and sell it at even greater volumes.

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But it gets worse. As it turns out, Kennard's version is also conjecture, nothing rests on it, and it is also dead. Like Heisenberg's version, it was always dead. Both were DOA, corpses propped up by sticks for eight decades. The SA article says that if Kennard's version were violated experimentally, the whole of quantum mechanics would break down. Funny, that's exactly what they said about Heisenberg's version for eight decades. Until it was violated experimentally, at which point they just moved a step sideways and kept going as before. And that's exactly what they will do when Kennard's version is violated. They will forget what they said before, no one will call them on it, and they will replace it with a third version, upon which quantum mechanics also rests upon like bedrock.

Notice this is already happening, in the article itself. First we are spun from Heisenberg to Kennard, then from Kennard to Ozawa. That's right, Kennard is *already* falsified, and they sort of admit that. According to Ozawa and Hasegawa, fluctuations aren't enough. The new Ozawa version of the HUP combines the error-disturbances of Heisenberg with the fluctuations of Kennard. Like this:

$$\varepsilon(q)\eta(p) + \sigma(q)\eta(p) + \sigma(p)\varepsilon(q) \geq h/4\pi$$

Error is $\varepsilon$, disturbance is $\eta$, and fluctuation is $\sigma$. But wait, didn't the author just tell us that the error-disturbances of Heisenberg were just conjecture, and that violating them meant nothing to quantum mechanics? Then how can we now be told, by Akio Hosoya, a theoretical physicist at Tokyo Institute of Technology,

The error–disturbance uncertainty relation is much more important than that of fluctuations.

Good lord, what a stirring of the brain! First A is alive, then A is dead, then A is unimportant conjecture, then A + B is reborn as new dogma.

Has anyone bothered to notice that the last equation is still written in terms of position *q* and momentum *p*? **While Hasegawa's data concerns spin components.** Might the interaction of these real motions have something to do with it? Might the problem be specific experiments versus general equations? We don't think spin components act like position/momentum at the macrolevel; why do we think they do at the quantum level?

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Because 20th and 21st century physicists have been such lousy philosophers and logicians, they were never able to crack the nut at the center of all this. As I have shown recently, they were diverted by Mach and Kierkegaard and misreadings of Hume, and they were more interested in novelties than in rigor. What causes and underlies both Heisenberg's formulation and Kennard's is a little logical truth that had been known by some for centuries, and that has nothing to do with the quantum level. It is true at all levels, including our macrolevel, and it has to do with the operation of measurement. That's right, it is a simple operational rule and nothing else.

Amazingly, the *Scientific American* article points at this, though darkly:

Ozawa's formulation confirms an emerging trend in probing the foundations of physics: to hew closely to what experimenters directly see in the lab—a so-called operational approach.

As you see, some seem to be recognizing that the HUP is a matter of operation, but they haven't cracked the operation yet.

The thing to notice about both Heisenberg's formulation and Kennard's is that the two variables are functions of one another. **More than that, one variable is the derivative of the other**. In other words, both versions refer to position and momentum. Well, momentum is a function of position. To make it even simpler, I won't talk of functions. I will just talk of operations. To calculate momentum, you need to calculate velocity. Momentum equals mass times velocity. The mass is given but you have to measure the velocity. How do you measure velocity? Can you measure velocity from one position? No. You need at least two positions and a clock to measure velocity. Even if you already have a background marked off, you still need a starting position and a final position, which gives you a distance. Distance over time is then velocity. You can't measure velocity from one position. So if you are looking at position *x* and velocity *v*, you are really looking at *x* and $\Delta x/t$. To "measure" *x*, you need *x;* and to measure *v*, you need *x*. And to measure *v*, you need *two* measurements of *x*. You can't measure two positions of the same particle with one measurement, can you?

You will say, "Sure, why not? Just measure over some amount of time, and keep looking." But no matter what, two positions are two measurements. It doesn't matter if you got them by keeping your eyes or your machines open. The point is, you can't get two measurements of position at the same *time*. Each position exists at a different time, by definition. If each position existed at the same time, the object wouldn't be moving and wouldn't have a velocity or momentum.

To put it another way, the velocity variable is time dependent, while the position variable is not. The velocity variable could be written as the derivative of the position variable. So the two variables aren't even the same sorts of numbers. One is a unprimed variable and one is primed. One is the change of the other. And yet they are popped into these equations unanalyzed, as if none of this could possibly matter.

I have already shown how this "uncertainty" creeps in to all macro measurements. I showed it in my analysis of the historical measurement of the speed of light from Mt. Wilson to Mt. Baldy.* And I showed it most recently in my analysis of the "neutrinos" going from Switzerland to Italy in the Great Neutrino Muddle. The speed of those neutrinos has a margin of error, either in mainstream math or my own. I showed that they were using the wrong margin of error, but either way there *is* a margin of error, and it is due to this problem of position and velocity. The margin of error is the uncertainty. That is what a margin of error is. That is what quantum uncertainty is—margin of error in operation caused by the way we measure velocity.

In this way, Heisenberg was actually closer to the truth than Kennard. The uncertainty *is* a function of the measurement. It has nothing to do with quantum fluctuations. But it is not a function of our tools being too large or quanta being too small. Nor does it have anything to do with error-disturbance. Nor does it have anything to do with probabilities. Nor does it have anything to do with the observer. There is no reason to let subjectivity creep in here, or indeterminacy. Yes, it does imply indeterminacy, in a way, but not the big squishy philosophical muddle we now call indeterminacy, which allows all sorts of magic to flow into physics. It is better just to call it a margin of error, as they used to—back in the old days when physics was still mechanical and still healthy.

This also explains the data from the Yuji Hasegawa team in Vienna, the data that led to this latest tempest. Notice that they are measuring spin components, not position and velocity. All their data tells us is that spin components can be measured more accurately than the HUP indicated. "Even when either the source of error or disturbance is held to nearly zero, the other remains finite." I predict that will also turn out to be true of other pairs of variables that are not derivatives of one another. In other words, where one variable is not a velocity or acceleration of the other variable. These spin components may be directly related, and one spin may even be a function of the other, but the spins aren't *derivatives* of one another. One spin isn't the change in the other spin. This makes the spins obey simple margin of error rules and operational rules, not squishy uncertainty principles.

You see, there is a reason mainstream physics is agreeing to replace Heisenberg's version with Kennard's or Ozawa's, even though it requires some hamhanded misdirection. Kennard's version is even squishier than Heisenberg's, and allows new physicists more room to fudge. They love the fluctuations, since these allow them all sorts of wiggle room. They have already tied these quantum fluctuations to vacuum fluctuations, which have allowed them to fudge all sorts of symmetry breaking and borrowing from the vacuum and so on. Any time you have an unassigned fluctuation, you can call it spontaneous and then do whatever you want to with it. This is how new physics works.

And Ozawa's mix of Heisenberg and Kennard is the squishiest of the three. Although it doesn't actually work on all variable combinations without a lot of pushing, it is preferred because it is more complex. As with nebular theory or tidal theory or orbital theory, when ten theories all fail, you don't throw them all out, you *combine* them. That is what we see here. The data has actually falsified both Kennard and Heisenberg, so of course the thing to do is combine them. If they can just pad the new equation out into about twenty more terms, written as partial differentials, Hamiltonians, matrices, and functions of *i*, then everyone will be happy.

One last thing. Notice that you can't read the paper or study the data for this problem unless you pay $18 to Nature.com. That's typical of the new science, hiding their data in expensive journals and propagandizing magazines. My critics like to chide me for asking for a $1 donation at the end of some of my papers, but they have no problem with mainstream physicists demanding money to see their data. [And this $18 is low, it is usually much more.] This despite the fact that the researchers are already well paid to do their research. I for one wouldn't pay a plug nickel for the sort of article we got from *Scientific American*, and if experience is any guide, the paper at *Nature* is the same sort of mess.

*See Part IX.