



The Observer Effect

On Karyn Taylor

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In her essay 'I Must Explode: Art writing and tactical practice', Gwynneth Porter invokes quantum physics as a discipline where the limitations of language become most palpable. She writes:

When quantum physics encountered the situation where light was found to be both particles and waves, they agonised, how could this be? The problem could be, some felt, that they were using language to study the world, and that nouns are parts of speech, not nature. Simply, the way language abstracts and over-simplifies, gives the formless form, means there are limits to its functionality.¹

Language, visual language included, is how we humans try to capture the world. We want to understand its mysteries, to give it structure and communicate its meaning. Quantum physics teaches us that the world will not be so easily contained, for it is always in motion, always vibrating, splitting, replicating, changing states. Nothing about our world is fixed. There is nothing to be understood.

It can be difficult to understand that there is nothing to be understood. Celebrated theoretical physicist Freeman Dyson describes the disturbing experience students of quantum mechanics must go through, learning the mathematics of the subject and getting all the right answers only to inevitably hit a wall. Around six months into their studies, students suddenly begin to worry that they have not really understood anything they have been doing up to that point. They become confused, trying to come up with a physical explanation for the impossible mathematical tricks they have been taught. None of it makes sense, until suddenly they emerge out the other side, understanding at last. The student has let go of prequantum concepts, has stopped trying to rationalise everything in these terms, has learned to think in quantum-mechanical language.²

I imagine most people reading this are not physicists. I certainly am not one. I imagine most people reading this are here for a discussion of Karyn Taylor's work. But before we get there, I want to

(opposite) KARYN TAYLOR *Circle Halved* 2018
Acrylic, 1000 x 1000 x 45 mm.

(right) KARYN TAYLOR *Harmonic Code* 2018
Acrylic, 400 x 400 x 45 mm.

(below) KARYN TAYLOR *Yellow Fold* 2018
Acrylic, 600 x 600 x 45 mm.

emphasise two things. First, as experience parsed into language, this essay is necessarily flawed. Second, there is nothing to be understood.

When I look at Taylor's art, I am struck by what I do not know. I do not know how they work, how they are made luminous, whether they are powered by electricity or made from some special, phosphorescent material. They make me think of the glow-in-the-dark stars stuck on my bathroom ceiling, relics from the room's former life as a nursery, but still emitting a pale green glow whenever I visit in the night.

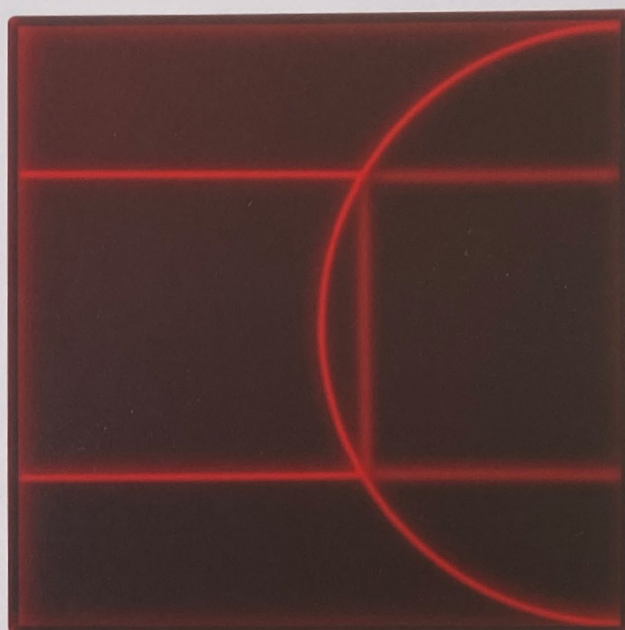
But it is not night-time when I view Taylor's latest works in her exhibition *Elements of Euclid* at Auckland's Sanderson Contemporary. The gallery is flooded with sunlight, and yet Taylor's paintings seem to emit a gentle glow all of their own, the hard lines of their geometric forms softened by a diffuse light. Take *Circle Halved* (2018), for example. The best way I can think to describe it is like a hot red laser beam frozen inside a thick slab of marigold-yellow wax—somehow still intact and shining through its viscous encasement. The beam seems almost to radiate heat, and has the curious quality of appearing infrared despite emitting no heat.

Other works on display have captured beams of white, pink and electric-blue light, sometimes combined with other, murkier submerged forms. In *Yellow Fold* (2018), it is as though a very simple paper plane has been laid flat and fossilised, its creases preserved eternally. There is something almost occult about these works: the way they seem to shift as you move past them, the way some colours seem to pulsate. Under these conditions, geometric forms start to look like symbols or even constellations, lines and shapes that could be communicating something, if only we could decipher them.

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Karyn Taylor's art speaks the language of geometric abstraction but draws on concepts from metaphysics and quantum physics—notoriously knotty disciplines concerned with questioning the unseen structures that underpin our reality. Her works are material experiments, attempts to bring complex ideas into some kind of logical order, to translate them into a visual language that reflects the abstract nature of quantum reality and elicits the sense of confusion all but hardened quantum physicists feel when faced with all that we cannot understand about our physical world.

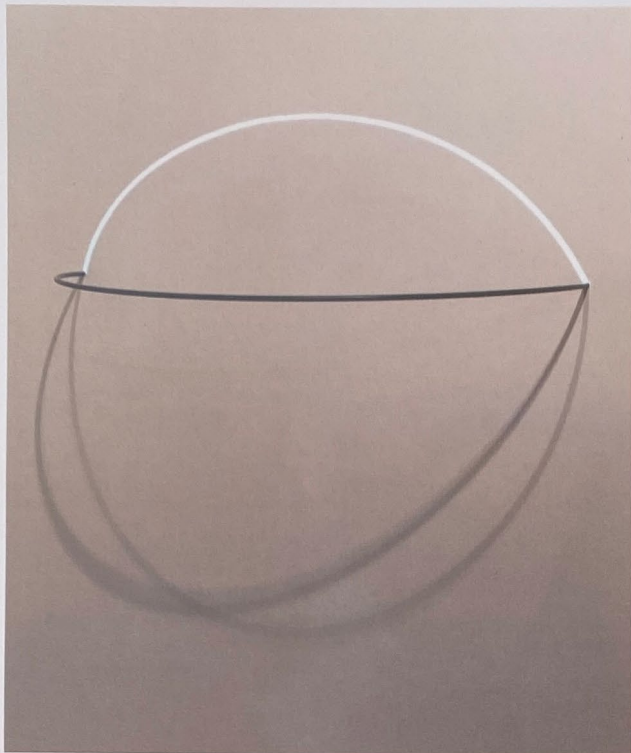
There are two limbs to Taylor's practice. One is her wall works, which although not technically paintings (they are cast from acrylic), are clearly in conversation with hard-edge and colour field painting. The other is her installation works. It is important to realise that, in spite of all I have said about lasers, heat and light,



these pieces are luminous without electricity, activated instead by the ambient light around them. It is in this sense that the second limb complicates the first, for her installations are hybrids of physical construction and digital projection. As Jaimee Stockman Young writes, the viewer is often 'unable to surmise what is static/sculptural and what is projections of constructed light'.³

A line may begin as a piece of wood and end as a beam of light. For *Arc in 3 States* (2017), a work that earned Taylor a Merit Award in the Parkin Drawing Prize, a curve of plastic tubing casts a similarly curved shadow on the wall beneath. So far, so ordinary, but it also casts a bow of pure white light upwards onto the wall above. Is there a word for the opposite of a shadow? Through echoing the form of the tubing with light, Taylor seeks to represent something that is impossible in quantum reality: the experiencing of the actual alongside the potential. This duality is emphasised through material choices, wood and PVC anchoring our experience in the everyday world while the arc of light hints at something else





(left) KARYN TAYLOR *Arc in 3 States* 2017
Animated light, PVC & shadow, 1200 x 1500 mm.

(below) Karyn Taylor with *Diagram for a Quantum Event* at Te Tuhi Centre for the Arts, Pakuranga, March 2018
(Photograph: Julie Downie)

(opposite) KARYN TAYLOR *Field Notations* 2017
Animated light, cherry wood, PVC & gouache, 3800 x 2200 mm.

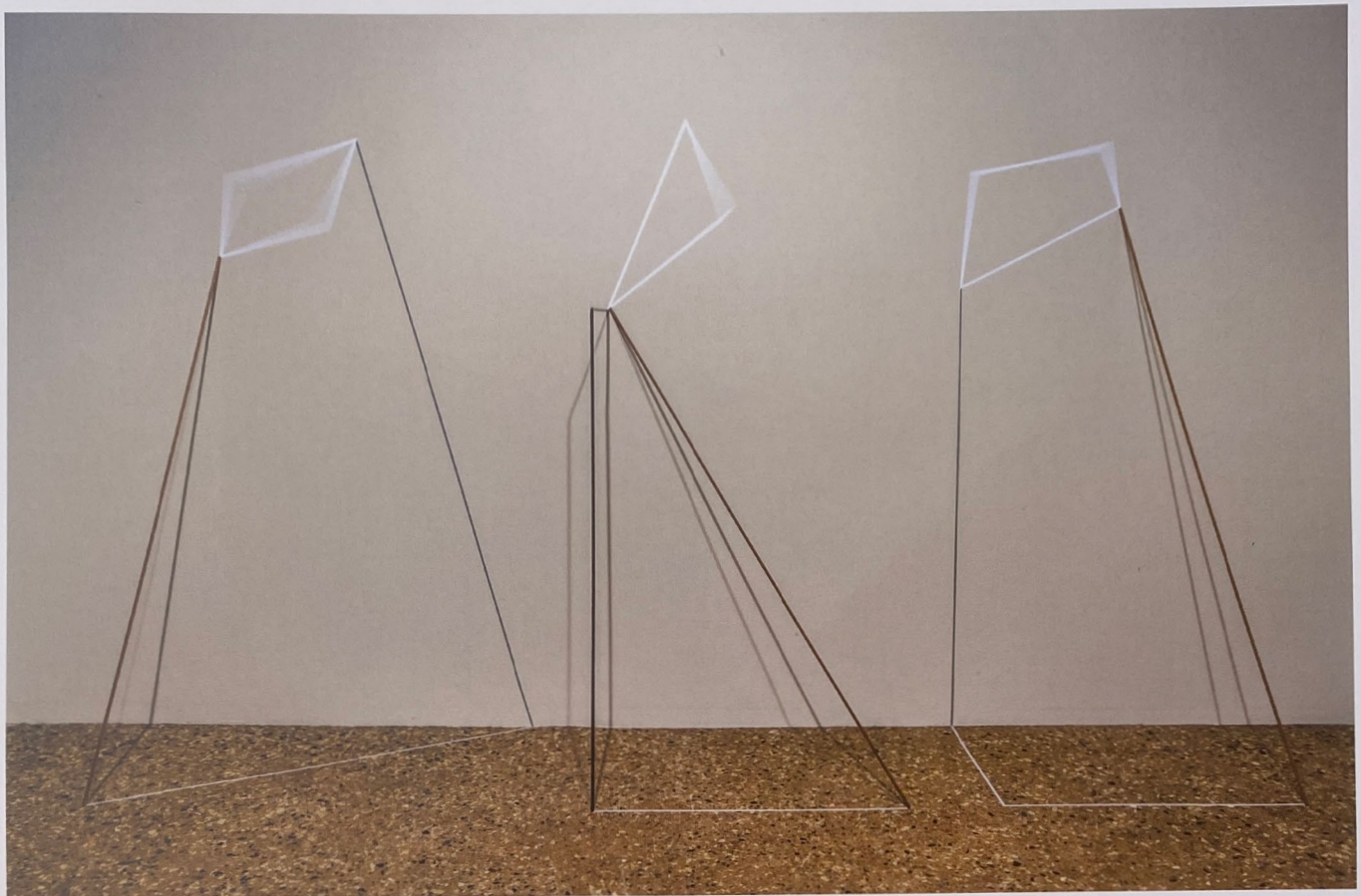
Borders, a group exhibition concurrent with the Venice Biennale. *Field Notations* (2017) was titled after quantum field theory, a theoretical framework which treats particles as 'excited states'—that is, it holds that particles are not solids, they are merely vibrations occurring within a field. The works themselves appear as three elegant, minimal sculptures assembled using a combination of spindly cherry-wood rods, PVC pipes and gouache lines, which seem to support a series of geometric shapes sitting atop them. Except the shapes are weightless, softly shifting rhombuses and triangles built from pure animated light flowing from meticulously placed projectors. As with *Arc in 3 States*, the works attempt to show us multiple dimensions all at once, combining light, time and matter—the ephemeral and the solid, the actual and the potential—into cohesive, aesthetic structures that also hark back in art history, recalling the work of seminal minimalists such as Dan Flavin, and Anthony McCall's pioneering 1973 film, *Line Describing a Cone*.

Taylor herself is no physicist and comes to the field as an artist interested in how we can influence reality—because, to be sure, we do influence it, although it is unclear exactly how. At the beginning of this essay I employed a quote from Gwynneth Porter describing the historic moment in quantum physics when light was found to be both particles *and* waves—a

that has perhaps always been there, we have just never been able to see it before. In an interview with Contemporary HUM, Taylor elaborates: 'I'm interested in the idea that we can't actually experience the quantum level because as soon as we do it becomes this reality that we know—you can't actually do both at the same time. But I'm looking at how one might experience some of both at the same time.'⁴

Taylor's work is often concerned with visualising this kind of duality. Last year, she exhibited a group of material installations in *Personal Structures: Open*





phenomenon that remains one of the greatest unsolved mysteries of the discipline.

The discovery came about during the 'double slit experiment', in which physicists directed a beam of light at a screen marred by two closely spaced, parallel slits. Some of the light photons passed through the slits, whereupon they struck another screen placed behind the first, forming a series of alternating bright and dark stripes. These stripes appear because light travels in waves, with peaks and troughs that interfere with one another as they move through the slits, leading to this effect which is known as diffraction.

However, when the scientists attempted to measure which slit the photons were moving through, something strange happened. The photons suddenly changed their behaviour. Instead of acting like waves, they began acting as particles. As Porter described, physicists were, and still are, flummoxed. How could the outcome of an experiment be affected simply by whether or not we chose to measure properties of the particles involved? Spookier still is the fact that this effect—now termed the 'observer effect'—does not just take place while we are actively watching. When physicists attempted to thwart the effect by making their measurements after the experiment, it made no difference. Particles may change their paths even when we are only *planning* to look.

There is a famous quote from quantum guru Niels Bohr which says that 'those who are not shocked when they first come across quantum theory cannot possibly have understood it'.⁵ Guru that he is, I am sure Bohr is right. I have certainly not understood a vast amount of the quantum theory I have encountered while researching this piece, and I remain

un-shocked. But I wonder if my serenity has less to do with my lack of understanding than the fact that I am encountering this knowledge through the context of Taylor's practice, in the language of art. In science, there is a basic assumption that there is an objective world 'out there' that exists regardless of whether we are watching, and it is this fundamental premise that the observer effect threatens. However, in art, we are used to the idea that the viewer completes the work, that all description and explanation is subjective. In the realm of abstraction especially, the pleasure of looking comes in part from the knowledge that there is nothing to be understood that is not becoming known to us simply through our experience of the work.

Although physicists cannot explain the observer effect, it does teach us that our presence, our looking, has consequences. Without words, Taylor's work conveys the very same thing. With words, all I can convey is what I have seen, and what I understand.

1. Gwynneth Porter, 'Spiders I have known and I must explode,' Master of Fine Arts research portfolio, Elam School of Fine Arts, University of Auckland 2009, p. 258.
2. Freeman Dyson, 'Innovation in Physics' in *Scientific American*, vol. 199, no. 3, 1958, pp. 74–82.
3. Jaimee Stockman Young, 'Time.Space.Existence', in *Personal Structures exhibition catalogue*, La Biennale di Venezia, Venice 2017, pp. 292–93.
4. Contemporary HUM, 'An interview with Karyn Taylor', published 22 September 2017, <https://www.contemporaryhum.com/karyn-taylor-interview>, accessed 21 September 2018.
5. Niels Bohr, in 1952, quoted in Werner Heisenberg, *Physics and Beyond*, Harper & Row, New York 1971, p. 206.