Qeios

Peer Review

Review of: "Quantum Emptiness: A Scientific Exploration of the Heart Sūtra"

Klaus-Dieter Mathes[1]

1. Centre of Buddhist Studies, University of Hong Kong, Hong Kong

The paper has many interesting thoughts, but the way the Heart Sutra is sometimes speculative. The sutra does not say anything about the cognitive process; it does not discuss things like the trikaya, etc. Within physics, one needs to distinguish between epistemic and ontic interpretations of the wave functions. I suggest mentioning that the mainstream follows the epistemic interpretation (i.e., Copenhagen). There is no room for mind in quantum mechanics. But you can apply the key elements of QM to other areas like the mind. Then one speaks of Generalized Quantum Mechanics (Atmanspacher, etc.). Physicists don't like this. Also, there is a difference between QM (which is non-relativistic) and Quantum Field Theory, which is relativistic and includes the Maxwell equations. All this gets mixed up, as if Quantum Physics would be a single theory beyond any conflicting interpretations.

In the following list, my comments in detail:

p. 1 “form” in the Heart Sutra includes the five skandhas, most of them being mental. Their dependent arising presupposes a mutual causal flow between mind and matter. Most quantum physicists do not accept that. “Observation” can be done by a machine and does not prove the influence of mind on matter for them.

p. 1 “Reality is … a spectrum of potentialities that morphs in the wake of observation.” Better measurement, as it can be done by a machine without consciousness. In this context, it should be noted that Roger Penrose, for example, considers present-day QM as incomplete for not including consciousness (among other things). Mainstream physicists do not see in measurement any role of consciousness. Wigner did this, but he is not accepted by the majority (even not by Penrose!).

doi.org/10.32388/YCW9DW

Prajñaparamita: Prajñāpāramitā

Sunyata: śūnyatā

p. 2

Mahayana : Mahāyāna (check for consistency)

p. 2: "... quantum mechanics, where entities can exist in superpositions, and events are determined probabilistically rather than deterministically."

According to the standard Copenhagen interpretation of QM, the wave function does not allow for a picture of what is occurring on the nanoscale. It does not represent an entity out there. It is an expression of our objective knowledge of the quantum system, gathered in repeatable experiments. In QBism, quantum states are not elements of reality, but represent the degrees of belief an agent has about possible outcomes of their making measurements. You don't ask questions such as what it is like to exist in two locations.

The author (like me) probably gravitates towards ontic interpretations of QM (David Bohm, etc.).

p. 3 "... urging us to look beyond the apparent to grasp the intricate interplay of phenomena, whether in the vastness of cosmic realms or the depths of human consciousness." Physicists do not accept applying QM to consciousness. There has been a dialogue between C.G. Jung and Wolfgang Pauli, who compared superposition/classical states to subconsciousness and consciousness. What you are doing here is that you take crucial elements of QM, such as superposition, and apply them to areas beyond physics. This is normally referred to as Generalized Quantum Theory (GQT).

p. 3 On energy conservation: This is normally an argument of physicists that mind cannot influence matter (which you need if you want to bring in mind without ascribing to Cartesian Dualism). You could argue, though, that the energy/time uncertainty allows for tiny violations of the energy conservation principle (See Wallace).

p. 4 I have problems with "...that energy remains undefiled by external influences." Neither in physics nor in Buddhism does this make sense.

p. 4 "Yet, in the quantum realm, as Feynman and colleagues explored, this energy is far from being a static entity." This applies to classical physics, too. Kinetic energy transforms into potential energy, etc., etc.

p. 4 “In the quantum world, energy is not just a scalar quantity but intricately tied to the wave function of a system” Again, this presupposes an ontic interpretation of the wave function. For most physicists, the wave function does not represent an entity in the world. It is only a tool for calculation and is not ontological.

p. 4 “The *Sūtra* emphasizes the illusory, mirage-like nature of the multitudes of possibilities that stretch before us. This perspective aligns with Redhead’s (1982) assertion that the very foundation of quantum mechanics is a hotspot for metaphysical exploration.” The sūtra teaches the inseparable nature of form (i.e., all factors of existence) and emptiness. Mirage-like means empty of independent existence. True, Nāgārjuna says (paraphrase), if emptiness is possible, everything is possible, but the multitude of possibilities is very much limited by our karma and habitual tendencies.

p. 4-5 “Drawing further parallels, the *Sūtra*'s phrase 心無罣礙 or 'the mind unobstructed' offers a perspective akin to the clear-eyed observation required in quantum mechanics—a perspective devoid of biases, misconceptions, and entanglements.” This does not make sense. An unobstructed mind refers to the mind’s true nature, to which you don’t have access when doing experiments in a laboratory. The word “entanglement” should not be used this way when writing a paper on QM, where entanglement has a very technical meaning. And again, measurement can be done by a machine.

p. 5 coexistence of a particle in superposition. Again, most physicists argue that the possibilities only coexist in a mathematical (Hilbert) space

p. 5 I don’t see how quantum probabilities find resonance in the consciousness realm. Do you mean that you create reality through observation? This would work, but I think the influence is on a subliminal level, i.e., mind and matter are only aspects of a common underlying ground, wherefore there can be entanglement between mental events and the material world (see Jung & Pauli: Atmanspacher)

p. 6 The objects of mind (意) are not material as governed by classical mechanics, but the sense data apprehended by the five sense organs. They get further processed, so to say. This is the standard cognitive process. The sūtra does not elaborate on it much, though. A Yogācāra interpretation of it would deny an external material reality altogether. The “external classical world of matter” being but a product of false imagining, like in a dream. A Madhyamaka interpretation denies classical states of material existence, everything being dependent arising and emptiness of inherent existence. The sūtra does not say anything about a classical reality of conventional truth. Simply that form is emptiness of inherent nature (svabhāva). There is nothing classical.

p. 6 A real existence of the non-local quantum world (ontic wave function) requires following David Bohm and goes against mainstream QM interpretations

p. 7 The sūtra does not say anything about the dharmakāya, Amitābha, time, or timelessness.

p. 7 The saṃbhogakāya is very subtle and can be experienced only by very advanced bodhisattvas, so how can it belong to the realm of classical Newtonian physics?

P. 8 I never heard of a "quantum triad of the unmanifested (quantum field), transformative (particles), and manifested (matter)"

Declarations

Potential competing interests: No potential competing interests to declare.