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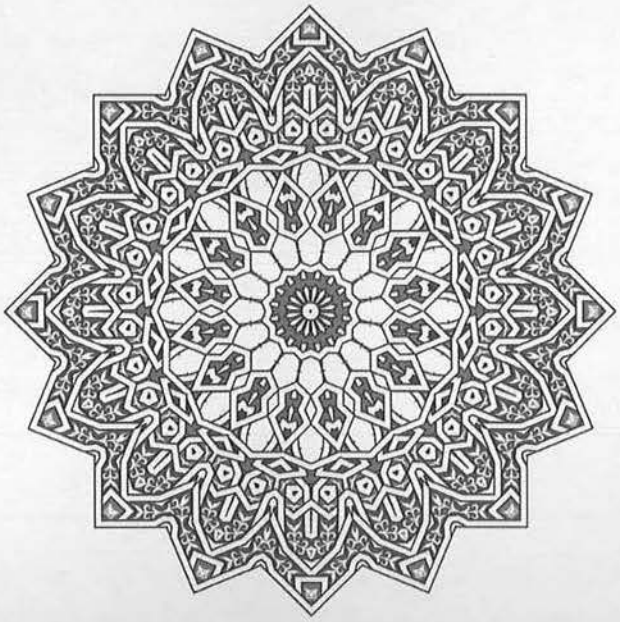
İSLÂMÎ İLİMLERDE KLASİK VE MODERN YAKLAŞIMLAR



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APPLİCATİONS OF DAQĪQ AL-KALĀM İN MODERN PHYSİCS
THE KALĀM QUANTUM ARGUMENT

*Mohammed Basil ALTAIE**

Introduction

The legacy of Islamic kalām is a novel resource for philosophical studies. It contains the views that the Mutakallimūn have proposed in their views for the world. The most important part of which is those premises or principles which are related to Natural Philosophy.

In his book "The Guide to the Perplexed"[1] Maimonides (1135-1204), a philosopher and a Jewish Rabi designated twelve premises of the Mutakallimūn. Reviewing those premises I could see that they actually subscribe to five fundamental principles[2], these are:

1. Atomism
2. Temporality
3. Re-Creation
4. Indeterminism
5. Spacetime Integrity

Using these principles the Mutakallimūn were able to analyze many problems in natural philosophy at their time and suggest their views about it. However, since the overwhelming world view of most of the schools of thought during the 8-12th century were adopting the Aristotelean philosophy, daqīq al-Kalām did not take its role in wide scope of applications in the topics of natural philosophy, while the Mutakallimūn themselves went into fierce internal debates and fights that caused lots of confusion and divisions that contributed to the de-

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[1] Maimonides, M. The Guide to the Perplexed, translated by Shlomo Pines, (2 Volumes) with introduction and notes. The University of Chicago Press, (Chicago: 1963)

[2] Basil Altaie, the Islamic Approach to Natural Philosophy: Principles of Daqīq al-Kalam. Beacon Books, U.K. In Press, to appear Nov. 2022.

cision of the Abbasid Caliph Al-Qadir Billah (947- 1031) to issue a formal order banning Kalām teachings in 425 A.H.[3]

Until the beginning of the twentieth century the above principles implied by the kalām were not in conformity with the scientific view about the natural world. Classical physics do not endorse the above principles. By the beginning of the twentieth century new physics were discovered as physicists tried to explain the phenomena in the microscopic world which underlays the events of the whole world. In our modern age we find that we have great chance to revive kalām in a modern perspective to be a powerful approach to comprehend the world and the meaning of our existence. Beside this, I find that kalām can provide us with solutions to fundamental questions in science and in science and religion debates.

The new formulation of daqīq al-Kalām suggested in my book (The Islamic Approach to Natural Philosophy: Principles of Daqīq al-Kalām) can furnish us with a full-fledged theistic philosophy of modern science. The five principles mentioned above can explain, at least on the conceptual level, the following:

Hugh (2004). The Prophet and the Age of the Caliphates: The Islamic Near East from the 6th to the 11th Century (Second ed.). Harlow: Longman.

1. The divine action in the world through the mechanism of re-creation and the principle of indeterminism, where the divine drives the laws of nature.[4]

2. The sustainment of the world through the process of re-creation.

3. The problem of quantum measurement (including quantum tunneling, quantum Zeno effect, quantum entanglement and quantum superposition) through the principles of atomism, re-creation, and indeterminism.[5]

4. The problem of time where daqīq al-kalām provide us with a "block universe" in which time is discrete measured by internal clock

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[3] Sourdel, D. (1978). "al-Ḳādir Bi'llāh". In van Donzel, E.; Lewis, B.; Pellat, Ch. & Bosworth, C. E. (eds.). The Encyclopaedia of Islam, New Edition, Volume IV: Iran–Kha. Leiden: E. J. Brill. pp. 378–379; Kennedy,

[4]

[5]

entangled with the events occurring in the universe. The events in this universe are unfolding in projections over the discrete time.[6]

The Kalām Cosmological Argument

William Lane Craig re-devised the kalām argument about temporality and creation, which was put forward by medieval Islamic scholars as proof of the existence of the Creator. Lane re-named it: "The Kalām Cosmological Argument" (KCA)[7], a term he basically took from a statement made by al-Ghazālī wherein he says: "every being which begins has a cause for its beginning, and the world is a being which begins; therefore, it processes a cause for its beginning".[8]

Craig articulated this argument using two premises and one conclusion. These are: 1- Everything that begins to exist has a cause of it existence.

2- The universe began to exist.

3- Therefore, the universe has a cause for its existence.

Craig took benefit of the scientific discovery that the universe came into existence 13.7 billion year ago as proposed by the Big Bang Theory and backed up by astronomical measurements. Accordingly, his second premise found strong practical support from astronomical evidence. Consequently, Craig defended this kalām cosmological argument enthusiastically.

However, there are objections to the KCA by those philosophers and scientists who do not find this argument to be fully supported by practical demonstration as well as lack of theoretical construct of the premises. Also, there were some scientific objections as to whether the universe really began to exist in the first place.

Here I will give a brief glance of these objections and questions.

Objections of Quentin Smith

Quentin Smith is an American philosopher who worked on philosophical problems in physics and religion. Smith uses the argument, held by some theoretical physicists to claim that the universe could

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[6] Altaie, M., Hodgson, D., & Beige, A. (2022). Time and Quantum Clocks: a review of recent developments. Frontiers in Physics, 460.

[7] Craig, William Lane. The Kalām Cosmological Argument. London: Macmillan,1979.

[8] Al-Ghazali, Kitab al-lqtislid fi'l-l'tiqad, with a Foreword by Ibrahim Agha, (Ankara: University of Ankara Press, I962), pp. I5-I6.

have been created out of a quantum vacuum uncaused by converting the random vacuum fluctuation which is thought to happen spontaneously without the need for a creator.[9]

This view has been championed in public debates by physicists such as Steven Hawking and Lawrence Krauss.

However, the claim that quantum fluctuation (virtual state) can be converted into real particles is possible only when a gravitational field (in the form of curved space time) exists. Such a field (or curved background) is necessary to prolong the duration of the virtual particles and provide the necessary positive energy required by the real particle- antiparticle pairs to exist. This requirement was recently recognized by Steven Hawking who declared that the universe can create itself with the aid of gravity. Hawking says: "because there is a law such as gravity, the universe can and will create itself from nothing"[10] The question is: where gravity comes from? Unless we know the answer for this question the issue will remain unfinished.

Grünbaum's Objections

Adolf Grünbaum is a prominent American philosopher of science working at the University of Pittsburg in the USA. His argument against the KCA perhaps is strongest among the philosophical ones. Grünbaum's basic objection is that the first moment of the Big Bang when the universe was created does not qualify as a physical *event*.

Physical event, according to Grünbaum actualizes in time, that is to say it happens in time and marks a moment of beginning for that event. But since time started with the Big Bang itself, we cannot identify a moment that preceded it which would qualify as an event by itself. Consequently, Grünbaum denies that the universe began to exist as an *event* took place at the first moment of the Big Bang.

Obviously, we can acknowledge that the world has existed for some time, but from the philosophical point of view such an acknowledgment may lack recognition of the first moment of the existence as an *event*. However, by all means the universe began to exist, not necessarily at a well-defined moment, but certainly such a beginning

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[9] Smith, Quentin. "The uncaused beginning of the Universe", Philosophy of science 55: 39-57, 1988; "Can everything come to be without cause?" Dialogue 33: 313-323, 1994.

[10] Hawking, S. and Mlodinow (2010). New York: Bantam Books, 10.

is marked on the scale of time by t=0. This means that we cannot claim that there is no start for the universe, but we can only say that such a start is not well-understood now.

Besides this, I should mention that, physically, the initial conditions for the existence of the universe is part of the big question in physics; it deals with the initial conditions which are unknown, and since the laws of physics cannot probe the first moment, this problem will remain a challenge for physicists as long as gravity and quantum

mechanics are not brought to terms. Craig responded to Grünbaum's objections with an article published in the British journal for the philosophy of science.[11]

Hawking and Hartle's No Beginning Argument

The famous theoretical physicist, Steven Hawking, in collaboration with William Hartle, put forward a theorem that shows that the universe could have existed for an endless imaginary time before the Big Bang.[12]

Some philosophers who were opponents of the KCA welcomed this proposition, considering it as disproof of the Big Bang and the invalidation of the beginning of the universe. The Hartle –Hawking proposition was well-received by some people who found it supporting there views of eternal universe, some others criticized the approach.

In response to this, the standard model of cosmology (the Big Bang Theory) was amended by including a phase of inflation at the very early stages of the development of the universe. The work was conducted by Alan Guth and his co-workers, who also coined the term 'inflation theory'.[13]

Despite the fact that this theory solved some fundamental problems with the standard Big Bang, it is still uncertain whether the scenario proposed is true. No solid evidence has been found to support a firm conclusion that inflation did take place.

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[11] Craig, William Lane. "The origin and creation of the universe: A reply to Adolf Grünbaum." British Journal for the Philosophy of Science (1992): 233-240.

[12] Hartle, James B., and Stephen W. Hawking. "Wave function of the universe." Physical Review D 28.12 (1983): 2960.

[13] Guth, Alan H. The inflationary universe: the quest for a new theory of cosmic origins. Random House, 1998.

Some alternative models, which are different from the standard Big Bang model, are also available. One of these is free from the problems inherent with the Big Bang Theory and provides a model for the universe without inflation. It suggests that the universe started from a Planck-scale? blub inflating naturally by continuous creation of matter and energy to the present state.[14] This model also proposes that the universe was spatially flat naturally from the very beginning as its average density is always fixed to be equal to critical density.

Hawking-Hartle theorem does not refute the real beginning of the universe since the claim that universe could have existed in an infinite *imaginary* time is realistically meaningless as the imaginary time is not a *physical* time, it cannot be measured.

Therefore, the Big Bang remains a real concept.

The above criticisms shows that the KCA is limited and that we need more profound argument to support the notion of a cause that acts beyond the physical universe. Such an endeavour may take us beyond the physical proof by contemplating the physical description of our world as explained by the postulates of quantum mechanics.

The Kalām Quantum Argument

Quantum mechanics is known to be the best available theory to explain the observed phenomena in the microscopic world (atoms and molecules). This theory has been tested and verified for more than a century now through thousands of experiments. It is a theory with many fundamental predictions that has been verified to very high accuracy. The theoretical foundations of the theory are solid, and its mathematical structure is rigorous. On the conceptual level, the theory may need further development in order to offer more realistic interpretation of the physical phenomena and resolve the paradoxes that point to some kind of incompleteness within the theory. Such a development of the conceptual interpretation has been offered by the introduction of the notion of re-creation from daqīq al-kalam. However, the main character of the theory is characterized by the probabilistic nature of events and the fact that physical measurements are indeterministic remain intact. To the contrary our interpretation of quantum dynamics through the mechanism of re-creation consolidates the probabilistic nature and the indeterministic nature of measurements.

[14] Altaie, M. B, and U. al-Ahmad (2011). "A Non-singular Universe with Vacuum Energy". International Journal of Theoretical Physics 50: 3521–8.

Criticisms mentioned above addressing the KCA can be superseded by the introduction of the *Kalām Quantum Argument*. This argument is based on the well-established discoveries of quantum theory which stipulates that the world is contingent. Quantum mechanics suggests that a quantum system can be realized in several possible states. These states are solutions for the respective equation of motion that controls the system. All suggested solutions are realizable with different probabilities. This has given quantum mechanics the character of being probabilistic on defining the happenstance of events in nature. All events ascribed by the suggested solution for a quantum system are expected to happen whether they have a low probability or a high one. However, quantum mechanics does not tell us which event will happen at which time. The question is what physical factor or set of parameters are defining the occurrence of the events? The answer is we don't know. No physical factor or parameter can be designated as an agency which is ascribing the event to happen at a given time. The situation remains indetermined.

However, one may think that future works may give us the chance to define such factor determining the happenstance of the events. We may discover a law that may complement the laws of quantum mechanics to tell us which probability will happen at which time. But this is far from becoming possible, because if such a law is discovered then its results (the designation of the occurrence of event at given time) will be probabilistic too. As such it is fair to say that no such law can be part of the set of the laws of nature. This is the metaphysical part in quantum mechanics which oblige us to assume that some agency beyond our physical world is controlling the occurrence of the events by choosing from the theoretically available state the one to occur.

Laws of Physics and Laws of Nature

In this respect we should take care to differentiate between the *Laws of Physics* and the *Laws of Nature*. While the later are the set of laws that we device to explain the natural phenomena, the former is the phenomena itself bare of any explanation (see chapter 2 of Ref.4). This difference is important for the proper designation of attributes to the actions in nature as some physicists are confusing the type of laws when they talk about the creation of the universe.

Laws of physics may change depending on the status of our comprehension of the physical world, while laws of nature are immutable as these are describing the natural phenomena happening.

The probabilistic nature of quantum system is a law of nature, and therefore is ascribing the contingency of the physical sates. This implies that the main character of quantum systems is not expected to change even if the quantum mechanics is developed further, say for example by merging it with the theory of general relativity. In fac we have already seen that such profound characteristics of quantum mechanics are preserved upon merging quantum mechanics with the theory of special relativity by the work of Paul Dirac[15] and other.

Furthermore, those characters did not change upon merging quantum mechanics with electrodynamics to produce the theory of quantum electrodynamics by Julian Schwinger and Richard Feynman.[16] The probabilistic nature of events and their indeterministic character are fundamental features of the world. Being manifested on the microscopic level does not mean that such features does not apply to the macroscopic world. These features are profoundly universal.

The above illustration of the fact that the world is contingent and probabilistic would certainly demand an agency to make the choice in effecting different contingent states. As illustrated above such agency cannot be part of the set of the laws of nature, since such laws need some operators to be initiated and are deemed to produce probabilistic and indeterministic results. Consequently, we must assume that such an agency is beyond the space time and beyond the physical world altogether. Although it is true that this is a metaphysical resort, but it is rationally inescapable.

The Mechanism

Sustainment of the universe seem to be performed through the mechanism of re-creation. The principle of re-creation suggests that the properties of objects are deemed to be under continued renewal. The renewal rate is expected to be very high, proportional to the energy of the system divided by the Planck constant. This makes and

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[15] Dirac, P. A. M. (1928). The quantum theory of the electron. Proceedings of the Royal Society of London. Series A, Containing Papers of a Mathematical and Physical Character, 117(778), 610-624.

[16] Feynman, R. P. (2006). QED: The strange theory of light and matter (Vol. 90). Princeton University Press.

electron, for example, getting re- created about 10^{21} a second. Scientifically, this perfectly in agreement with the wave nature exhibited by microscopic objects; the re-creation of a state generates a probabilistic distribution for the values of its physical observables. This has been already demonstrated through the mathematical structure of quantum mechanics. Indeterminism is just a factual outcome of such re-creation.

Philosophically, this mechanism provides us with an explanation for the divine action in sustainment of the world. Re-creatin followed by the choice of the value of the observable means the choice of one of the contingent states of the system with its prescribed probability whether it is low or high.

On a large scale such a mechanism is a complicated issue in our view having limited knowledge and power. However, for the creator this is not the case as the creator observes all the possibilities and is free to choose from the respective states by his volition. In this respect the Qur'ān expressed the mechanism in few words "Your Lord creates and chooses whatever He wills". (28:68).

The Current Importance Kalām

My project to revive Kalām goes beyond *Daqīq al-kalām* and the academic interest. The idea is that upon establishing the proper worldview in respect to the topics in natural philosophy, we can then tackle topics in *Jalīl al-Kalām* which covers the Aqīdah and Sharī'ah. We first need to lay down the basis (Uṣul) and the methodology for such a venture. This include setting the rules for dealing with the two main sources of Aqīdah and Shariah, which requires adopting rules for understanding the Qur'ān and establishing rules of rectifying the narrations of the Hadith. Once this is done, we can leave the rest of the judgement to knowledgeable people to consider studying problems of social, economic, political, and other matters of public interest on the fundamental basis for deducing sharia laws, seeking help from the intellect ('aql) and science.

Conclusions

In this article I have tried to expose the need for a generalization of the KCA taking into consideration the knowledge we gained from quantum mechanics. It is shown that the role of the first cause is not restricted to the first moment of the creation, but it goes beyond that.

Laws of quantum mechanic characterized by the probabilistic nature and indeterminism oblige us to look for a sustainer of the world.

Here I suggest The Kalām Quantum Argument (KQA) as a generalization of the KCA. It is demonstrated in this thesis that the sustaining agency cannot be part of the physical world. Accordingly we must resort to the metaphysical agency that rules the choice between many contingent states of the physical world, thus causing the happenstance of events in accordance with the known laws of nature. This vision borrows from kalām the principle of re-creation and is related consequences in the principle of indeterminism,

This view can provide a full-fledged theistic philosophy of modern science. There are many topics that need to be studied in more details and we find that the subject is widely promising both on the academic level and the intellectual levels.