A challenge to experience the universe as a whole

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Abstract The whole is more than the sum of its parts. Einstein wanted to experience the universe as a whole with cosmic religious feeling and considered the rest as details for disciplinary research. He developed the methodical *principle theory* to enhance *humanity's ability* to experience the universe as a whole. However, the scientific community is blind to the principle theory approach. The unconstrained thinking of expert scientists (and philosophers) has permeated the scientific field. Academic and research tasks concerning the universe continue to accumulate but may not enhance our understanding of it.

Keywords Einstein's cosmos, Oscillating universe, Principle theory, Quantum gravity, Research agenda, Trap of free will

1 Experiencing the universe as a whole

Principle theory[1,2] considers three possible constraints: (1) whether a principle theory clearly depicts what the empirical universe was, is, or will be; (2) whether it clearly defines the logical structure of the empirical universe; and (3) whether it has experiential or experimental support.

How can principle theory be applied to experiencing and understanding the universe as a whole? Based on the theory of relativity, the universe is either expanding or contracting, and Hubble indirectly observed the expansion of the universe in 1929. The foremost law of nature, $E = mc^2$, clearly reveals the logical structure of the universe as a whole. Specifically, the totality of mass-energy of the universe in time series is a cosmic constant. As the empirical universe evolves, this totality of mass-energy distributes, redistributes, and transforms while maintaining its overall volume.

One question remaining of principle theory is whether our empirical universe is expanding indefinitely or is an oscillating universe (i.e., an endlessly expanding and contracting universe). Principle theory demands that the empirical view must be symmetrical to the logical view. This naturally leads one to consider articulating a symmetry between the empirical universe and the totality of mass-energy. In other words, if the universe is expanding indefinitely, the totality of mass-energy must be mathematically infinite. Since the totality of mass-energy must be finite, our universe is an endlessly expanding and contracting universe (Latin *quod erat demonstrandum,* QED). Thus, principle theory is the only known method that can rise to the challenge of experiencing the universe as a whole and address the eternal antithesis between empiricism and rationalism.

The scientific community is ignorant of principle theory and thus substitutes it with rich free will. Some salient examples are given below. Although the universe as a whole empirically refers to the totality of existence, the scientific community still tells us that our universe is but one among an enormous number of separate and distinct universes called the multiverse,[3] all inaccessible to humanity except for the universe that we inhabit. Whereas there are only positive energies logically, the scientific community freely introduces the concept of negative energies[4] to allow nature to create any number of fragmentary universes while pretending to satisfy the energy conservation law, which is based on the foremost law of nature, $E = mc^2$.

Further, the scientific community does not realize that the empirical view must be symmetrical to the logical view. Thus, quantum-gravity theory[5] focuses on refining the pure logical view of the universe without acknowledging the need to describe what the quantum-gravity empirical universe that can enable quantum-gravity theory looks like. We must face the challenge of experiencing the universe as a whole using the principle theory approach.

2 Building up the cosmos

Admittedly, the three levels of the present universe, that is, the microcosmos, macrocosmos, and mesocosmos, have been defined as principle theories by quantum mechanics, general relativity, and the success/failure system, respectively. By presenting a jiggling universe, quantum mechanics showed the atomic structure of the universe, reflecting the microcosmos, and was not considered a principle theory consciously. By depicting a moving universe, general relativity revealed the time-space structure of the universe, reflecting the macrocosmos, and was developed as a principle theory consciously by Einstein. By experiencing an erring universe, the success/failure system exposed the success/failure structure of the universe, reflecting the mesocosmos, and was opportunely developed following the principle theory.[6-14] Paradoxically, humanity lives in the universe at the mesocosmic level generation by generation but never experiences the mesocosmos. Only Einstein comprehended the existence of the mesocosmos.

Einstein[1,2] said, "The supreme task [*Aufgabe*] of the physicist is to arrive at those universal elementary laws from which the cosmos can be built up by deduction." Thus, these three universal elementary laws, that is, quantum mechanics, general relativity, and the success/failure system, can be used to deduce an understanding of the past universe (the early universe, including the big bang) and of the future universe (the contracting universe in one cycle in an oscillating universe). *Einstein's cosmos* is a single logical system of the empirical universe as a whole.

3 A research agenda

What can we find by setting a research agenda? First, principle theory addresses the challenge of experiencing the universe as a whole. Nature (the universe) has a pre-established harmony and imposes constraints on the process and discovery of its laws. Thus, Einstein invented this constrained methodical thinking called principle theory. Without knowing principle theory, the scientific community continues to pursue

theories of the universe with no direction and unconsciously falls into the trap of free will. Worse still, they consider no more new laws of nature. One would appreciate the transformation of this lingering free-will-led science.

Second, Einstein's cosmos and principle theory herald a new scientific approach for the twenty-first century. Despite their significance and through no fault of Einstein's or ours, it has been unusually difficult to publish regarding the success/failure system, principle theory, and Einstein's cosmos. Writing on Einstein's and our own behalf, we feel that the scientific community has misunderstood Einstein, lost academic freedom, and refused to be dictated to by nature. Thus, a great scientific turning point emerges. There is only one suitable path to a theory of the empirical universe: Einstein's cosmos and principle theory. They constitute what is essential rather than disciplinary in science and represent the scientific community's collective right and duty in the twenty-first century.

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