

# Bijjective Epistemology and Cosmology

Amrit Sorli

Foundations of Physics Institute, Idrija, Slovenia  
[spacelife.institute@gmail.com](mailto:spacelife.institute@gmail.com)

## Abstract

Bijjective epistemology results confirm models of “space-time” and “empty” space have no counterpart in physical universe. NASA results confirm universal space is “flat”, means it corresponds to the Euclidean geometry. Riemann finite geometry seems not to be an adequate model of universal space. The only possible alternative is infinite Euclidean universal space which has origin in quantum vacuum. As theory of infinite numbers confirms “infinity” is not a metric term, this opens new perspectives about the qualitative dimension of the universe which surpasses empirical scientific research methods

**Key words:** bijjective epistemology, cosmology, Riemann geometry, Euclidean geometry, quantum vacuum, observer

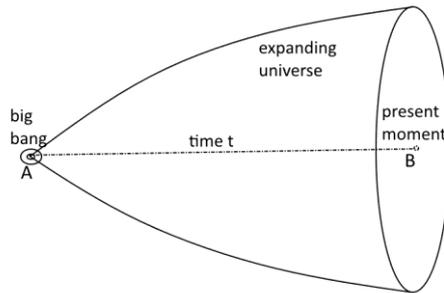
## 1. Introduction

Our recent research on bijjective epistemology confirms time is not a 4<sup>th</sup> dimension of space and space-time model has no a counterpart in physical universe. Further on bijjective epistemology denies that an “empty space” deprived of physical properties could be a medium in which run physical changes. Term “empty space” has no counterpart in physical universe, exists only as a mathematical model [1]. These results require that universal space has some more fundamental origin; we propose in this paper origin of space is quantum vacuum. Results of our recent research confirm curvature of space-time model in General Relativity is a description of energy density of quantum vacuum [2]. Our model is supported by the results of NASA research which confirm concrete universal space is not curved; it corresponds to the Euclidean geometry [3]. Considering that universal space is flat model of “space curvature” has counterpart in some ontologically deeper physical reality which is variable energy density of quantum vacuum.

In the theory of infinite numbers is known that if we say that cardinal number of natural numbers is equal to the cardinal number of real numbers, we do not enter in contradiction. If we say that cardinal number of real numbers is bigger than cardinal numbers of natural numbers, we also do not enter in contradiction. This confirms that “infinity” is not a metric term. Infinite distance plus 1000 km is still infinite distance. Considering that Euclidean space corresponds to the geometrical form of universal space we will have difficulties to approach universe as a close system which has finite amount of matter and finite diameter and can be fully described. It is more reasonable to study laws of observable universe which homogeneity assure that the same laws are valid in entire infinite universe.

## 2. Cosmological model “Universe in Dynamic Equilibrium” – UDE

In quantum vacuum which is the fundamental arena of the universe time has merely a mathematical existence. Past, present and future are not 4<sup>th</sup> dimension of space, they have only a mathematical existence [5]. Universe exists in what Albert Einstein use to call NOW: “...there is something essential about the NOW which is just outside the realm of science. People like us, who believe in physics, know that the distinction between the past, present and future is only a stubbornly persistent illusion” [6]. Common picture of the universe expanding in time is not appropriate any more, see figure below:



**Fig.1** Imagine of Big bang cosmology

Universe exists in quantum vacuum (from now on “dynamic quantum vacuum” – DQV which is NOW. Universe is timeless in a sense that time is not a physical dimension in which universe exists. This view is also confirmed by the research of Kurt Gödel. By 1949, Gödel had produced a remarkable proof: “In any universe described by the Theory of Relativity, time cannot exist”.

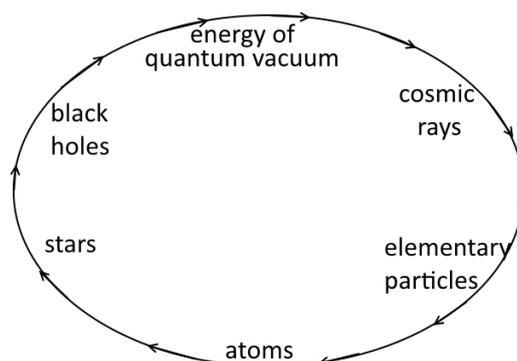
Model of the universe where time is only a mathematical parameter of change, i.e. motion requires the re-reading of some experimental data. Considering that universe exists in physical time the interpretation that cosmic microwave background radiation (CMB) has a source 380000 years after big bang makes sense because time  $t$  is a physical dimension which relates big bang (on the Figure above point A) with present moment (on the Figure above point B) in which we measure CMB, with other words time is a transmitter of CMB. Considering that universe exists in DQV which is NOW, CMB cannot have its source in some hypothetical physical past and time cannot be transmitter of CMB.

The source of CMB is present in actual universe that we observe. In this perspective also BICEP2 model of gravitational waves as ripples of space-time which have origin in big bang is questionable. Gravitational waves (if they exist) should have origin in DQV which is NOW. In our model gravity is a result of fundamental symmetry between given particle or material object and diminished energy density of DQV. Our model does not predict existence of hypothetical graviton and also does not predict existence of gravitational waves.

NASA results confirm with 0.4% margin of error universal space is “flat” [3]. This means observable universal space has a form of Euclidean space. In General Relativity (GR) universal space is curved. Between NASA results and curved space in GR seems to be a discrepancy. In our model curvature of space in GR has origin in a variable energy density of dynamic quantum vacuum (further on “DQV”). There is no discrepancy between NASA results and model of curved space in GR.

Stability of elementary particles requires a certain energy density of DQV. In the centre of black holes energy density of DQV is at the minimum and reaches below required energy density which is giving stability to elementary particles. In singularities elementary are not stable anymore and disintegrates back into fundamental primordial energy of DQV.

In intergalactic areas energy density of DQV is at the maximum. In intergalactic areas energy of DQV is continuously transforming in cosmic rays and this further in elementary particles [4]. This circulation of energy “matter – DQV– matter” is in a permanent dynamic equilibrium.



**Fig.2** Permanent circulation of energy in the universe

In black holes singularities “old matter” is transformed into “fresh” fundamental primordial energy of DQV which is not created and cannot be destroyed. Increasing of entropy of matter that we observe in the universe does not increase the entropy of entire universe which as the whole has no entropy. Black holes are rejuvenating universe which is ageless. According to our cosmological model **UDE – Universe in Dynamic Equilibrium** this universe is a non-created system. The question of “the beginning” and “the end” of the universe seems not appropriate.

### 3. Qualitative research of the universe

The “infinity” of the universe shows beside quantitative properties universe has also qualitative properties which cannot be fully grasped by the today empiric rational scientific methodology which experiences universe in the frame of linear psychological time “past, present-future” Empiric scientific experience is “temporal”, we propose in this article also “timeless experience” of the universe which reveals qualitative properties of the universe. Conscious observer has abilities to recognize that linear time “past-present-future” has origin in the human mind [7].

Timeless experience is reaching beyond duality “subject-object”; it reconnects observer with the universe so that he got inside of its “infinity” which Albert Einstein called “mysterious”: “The most beautiful thing we can experience is the mysterious. It is the source of all true art and science” [6]. Timeless experience brings Einstein’s NOW in science. Temporal experience and timeless experience are complementary and are enriching each other. First is the basis for development of technology, second reveals sacredness of the universe which is the source of true ecology which puts life as first and profit as second.

#### 4. Conclusions

Bijjective epistemology based on bijjective function of set theory fulfils Einstein's vision about completeness of a given scientific model which requires that each element of a model has exactly one counterpart in the universe. Application of bijjective epistemology in cosmology suggests that universe is a non-created system in a permanent dynamic equilibrium. The questions about "creator" and "beginning" of the universe are replaced with the question of how to experience "timelessness" of the universe. Bijjective epistemology enlarges classic scientific methodology with "individual introspective research" reaching beyond linear time into timeless experience which unveils sacredness of the universe.

#### References:

1. Fiscaletti, D. and Sorli, A.: "Bijjective Epistemology and Space-Time", Foundations of Science, published online 11. december 2014.
2. Fiscaletti, D. and Sorli, A.: "Space-time curvature of general relativity and energy density of a three-dimensional quantum vacuum", *Annales UMCS Sectio AAA: Physica* **LXIX**, 55-81 (2014).
3. NASA, [http://map.gsfc.nasa.gov/universe/uni\\_shape.html](http://map.gsfc.nasa.gov/universe/uni_shape.html) (2013).
4. M. W. Friedlander, *A Thin Cosmic Rain: Particles from Outer Space*, Harvard University Press, Harvard, 2002.
5. Fiscaletti, D. and Sorli, A.: "Perspectives of the Numerical Order of Material Changes in Timeless Approaches in Physics", *Foundations of Physics* **45**, 2, 105-133 (2015).
6. Sorli, A., *The Physics of NOW*, Amazon, (2014).
7. Sorli, A., Fiscaletti, D., Gregl, T. (2013). New Insights into Gödel's Universe without Time. *Physics Essays*, 26(1), 113-115.