

What is Biocosmology and the Biocosmology Initiative? Response to 6 critical articles by Chinese scholars. Part 1

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Что такое Биокосмология и Биокосмологическая Инициатива?

Ответ на 6 критических статей китайских ученых. Часть 1

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Abstract. In 2021, the *Biocosmology Initiative* was released. In 2022, 6 articles from Chinese authors were submitted to the Discussion section of the *BCnA*-journal, which critically examine the *Initiative*; and what is now an important resource for the whole BCA community activities. In response, with great appreciation to the colleagues : the authors start (with the given paper) a reciprocal reflection on the stated worthwhile theses, presenting now the first (initial) part of the reflexive response on the valuable critique by Chinese scholars; here starting with the main notions of Biocosmology, aiming here at the “rectification of names” (according to Confucius).

Keywords. Biocosmology, Taoism, holism.

Резюме. В 2021 году была опубликована Инициатива по биокосмологии. В 2022 году в раздел «Обсуждение» журнала ВСнА было подано 6 статей от китайских авторов, в которых критически рассматривается Инициатива; и то, что сейчас является важным ресурсом для деятельности всего сообщества ВСА. В ответ на это, с большой благодарностью к коллегам: авторы начинают (данной статьей) взаимное осмысление заявленных достойных тезисов, представляя сейчас первую (начальную) часть рефлексивного ответа на ценную критику китайских ученых; начиная с основных понятий биокосмологии, стремясь здесь к «исправлению имен» (по словам Конфуция).

Ключевые слова. Биокосмология, даосизм, холизм.

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Introduction: the main notions of Biocosmology. The question is often asked: What is Biocosmology and the Biocosmology Initiative – is it a worldview or a science?

Here the answer is unambiguous – it is in unity both the first and the second.

To begin with, we note immediately that the basic concept of Biocosmology is the *subject of life* (or *living subject*) – an autonomic active universal entity capable of Auto-changing and Auto-evolvement (in the complexity of organization), in the universally Auto-evolving Biocosmos.

In the Biocosmological approach, the notion of a *subject of life* (subject of EvoProcess, in the abbreviated form – *subject*) – here *subject* has the universal significance; it is the natural-scientific concept of a *free* (to move and interact) *physical* (Natural, Cosmic) *autonomic* individual entity. *Subject of life* refers both to naturally living (by Nature) world-Kosmos as a whole; and to each subject of the living Biocosmos (any of their countless number on planet Earth) – from a free micro-particle, to free (autonomic) man and society-civilization, and the whole mankind. Each one is a *living subject by Nature*, i.e. it is originated *from within* (produced by) the integral Auto-evolving world-universe (Biocosmos, Kosmos, EvoProcess).

At the same time, each living subject is a (micro)Kosmos itself – through coherent organizing other needed subjects for its/her/his consistent successful Auto-evolvement. Essentially, within the Auto-evolving Biocosmos : here the main inner potential, powers and possibilities of each *subject of life*, throughout its full lifetime (ontogenesis) – all this exists for the ultimate, to the fullest extent, realization of purposefully-organized (Telos-telic – *Entelechist*, goal-driven) Auto-evolvement; with the ultimate attainment and realization by the *subject* of its/her/his natural inherent Functionalist (effector) abilities; and that all is realized on the basis of constant Auto-maintenance and Auto-management, at the homeostatic (rather, *homeodynamic*)² level, of all its/her/his vital functions.

To conclude, Biocosmology (“Bio-” with a capital letter) deals with the study of any life phenomenon realized by an individual *subject of life* – as the organ within the Biocosmic Evolutionary Process (EvoProcess)³. In other words, the scope of Biocosmology becomes the scientific study of all kinds of natural (natural science) *subject* ontogenesis, studied at all levels and in all processes of its

² Homeostasis - maintaining the constancy of optimal (for life) parameters of the internal environment of the organism; and that is provided due to the activity of internal forces of the subject, hence – *homeodynamics* becomes a more appropriate term here.

³ The notion EvoProcess means, in the Biocosmological approach – naturalistically inherent Auto-ascending (by complexity of organization) evolutionary Process of living Nature and Cosmos – Biocosmos, or Kosmos.

organization – both the singular integral EvoProcess itself and the life individual ontogenesis of any subject. Naturally, for today, out of all their uncountable multitude : our primary scholarly interest is directed at the study of both the wholesome ontogenesis of a contemporary man; and the wholesome ontogenesis of a positive civilization (“cultural-historical type”⁴; or the ontogenesis of “ethnos” and “superethnos”)⁵ – consistently at all strata of the EvoProcess: Geophysical, Biospheric, Anthropological, Sociocultural, Ecological and Noospheric.

In everything, for each *subject* of the EvoProcess : here the cornerstone becomes the universal Biocosmological principle of *free* ontogenetic Auto-ascension of the *subject* to successively higher (in the complexity of organization) strata of the individual Evo-ontogenesis (of everything and everyone – within the Kosmos and the EvoProcess’s current Time). It is important to note that the single integral Kosmic EvoProcess realizes its Auto-ascension (in the complexity of organization) precisely through individual effector *Telos*⁶-contributions into the common EvoProcess – by a great multitude of active-effector subjects, actually constituting and realizing the single integral evolutionary Biocosmist (Biocosmological) movement.

Because of its comprehensiveness, Biocosmology is essentially in need of a universally recognized reference framework – in order to achieve mutual understanding between scholars⁷, and subsequent effective interaction. For the BCA such conceptual all-encompassing bases are, first of all, the doctrine of Taoism; and Aristotle’s *Organon* Kosmology, with its main principles of *entelechism* and *hylemorphism*. It is significant that both the original Aristotelian concept of *Organon*; and the

⁴ Following the civilization theory of N. Ya. Danilevsky (1822–1885).

⁵ According to the theory of *ethnogenesis* by L. N. Gumilev (1912–1992).

⁶ *Telos* (Greek: τέλος) – in the Biocosmology, the concept *telos* (in full accordance with the Greek τέλος) means “result of action”, and it has the natural-scientific significance : since *Telos*–“result of action” originates in and is generated by the endogenous *entelechist* driving Biocosmic forces-causes that act *from within* the subject; and which (*telos*-generated energy) is aimed at the achievement and realization of a higher (in complexity) result-contribution to the comprehensive movement of the EvoProcess. A famous judgment of Cicero says: “The Greeks by *Telos* understand the supreme, ultimate or final Good”. With regard to Aristotle’s science, another statement is significant, by John Herman Randall, Jr. [1962]; here the renowned scholar concludes that the Aristotelian “break with Plato is complete: *natural teleology* (italics is our. – **Authors**) has nothing to do with reason and ‘purpose’, which in English implies ‘conscious intention’ but is a mistranslation of *hou heneka* and *telos*”. This issue is discussed in detail in the *BCnA*-article with the title “*Editing the English version of the Biocosmology Initiative, year 2022*” [Khroutski, 2022].

⁷ Often the situation is such that scholars propose their own (different) concepts, but which are difficult to perceive from the first time – because of the diversity of their basic concepts and, consequently, the expressed variability of their conceptual and terminological apparatus (hence, challenging the difference and seeming dissimilarity of the terms used in the designation of the same general principles) in the ongoing research.

derivative Biocosmological meaning of the term *organic* – the meaning of both derives from the Greek ὄργανον, which has the original meaning of “instrument” (“tool” and “means” to achieve the goal-result) – i.e., the intended result of an action. *Organon*, in fact, is the natural goal-function of any organ (subject), which realizes and undergoes its *entelechist* ontogenetic path in Biocosmos. Therefore, Biocosmology should be considered as a contemporary scientific and philosophical expression of the teachings of Aristotle and Lao-tzu.

1. Contribution of Chinese scholars to the evolvement of the *Biocosmology Initiative*

Of great appeal and value to the BCA are the works of Chinese scholars⁸, who aim to critically examine the merits and demerits of the *Biocosmology Initiative* (BCI) put forward in the BCA. With great interest, in the course of their study : we made it our task to examine in the works of Chinese scholars both the essential points of their agreement with the principled grounds and objectives of the BCI put forward; and divergence with the BCI positions, or issues of insufficient understanding of certain tenets of the *Initiative*. In general, at the first stage, our goal is to identify and emphasize the key points of the BCI, which are still a bit difficult to understand for scholars – mainly in relation to the proposed comprehensive (Biocosmological – Organicist) approach; and which require their additional full clarification – to be subsequently put on the agenda of contemporary scientific and philosophical activity, to its evolving and actual exercise.

The scrutiny of the Biocosmology Initiative (BCI) has been undertaken since the 2021. This study is organized within the framework of the Biocosmology community, within the pages of the journal “*Biocosmology – Neo-Aristotelism*”, and its initiators are Russian and Chinese scientists. Undoubtedly, the initiated work makes a great contribution to the growth of fundamental *Organicist* (Biocosmological) thinking of modern scholars – which directly leads to the scientific understanding of naturalistic (natural science) dynamics of the present and future evolvement of the living peace-world of the Earth; as a manifestation of the successively higher result of the Auto-evolution of the living Kosmos (EvoProcess). Therefore, our current task (with respect to the BCI) is to conduct a comparative study of substantive papers (that explore the BCI) presented by Chinese scholars. To date, we have six papers, all published in the previous, 12th volume of the *BCnA*-journal in the section “*Discussion of the Biocosmology Initiative*”. These papers and their brief designations (for referring to) are:

⁸ All 6 papers were published in the *Biocosmology Initiative Discussion section*, in Volume 12 of the *BCnA*-Journal.

- 1-(**MV&CI**) “The **M**ethodological **V**alue of the Biocosmology Initiative **and** Its **C**ontemporary **I**mplications for the Construction of a New Civilization” by ZHANG Xihua and LIU Jingyuan;
- 2-(**PhThs**) “**P**hilosophical **T**houghts on Biocosmology” by CAO Mengqin;
- 3-(**RTrC**) “From Modern Science to Contemporary Science: **R**ejection of **T**ranscendental **C**osmology and Exploration of the Biocosmology” by XIAO Xianjing;
- 4-(**VBT&PP**) “The **V**alue of **B**iocosmology for **T**oday and Some Issues on the **P**ath toward its **P**ractice: Comments on “Addressing the Scientific Community –the *Biocosmology Initiative*” by CHI Xuefang and YE Ping;
- 5-(**NPhBMC**) “A **N**ew **P**hilosophy **B**eyond Traditional **M**echanical **C**osmology” by ZHOU Guowen et al.;
- 6-(**MHWEx**) “Biocosmology: A **M**odel of **H**umanity's **W**orld **E**xperience in the 21st Century” by JIANG Hongyu and GAO Han.

2. *Pro et Contra*: Chinese scholars' views on the Biocosmology Initiative

Naturally, we proceeded initially with the task of ascertaining those important research positions, in the works of Chinese scholars – which are substantially consistent with the premises of the *Initiative*. Thus, in the (**NPhBMC**)-study : the authors agree that “we should re-interpret the cosmology of the 17th century in an organic way, realize the contemporary turn of the organic cosmology, and finally form a systematic and scientific philosophical worldview and the methodology of building a new human civilization.” [p. 383]. Another (**MV&CI**)-research upholds this position and complements it: “the *Initiative* has not only the methodological significance of scientific cognition but also the contemporary significance of constructing a new civilization at its beginning.” [p. 261] In the next (**VBT&PP**)-study and analysis of the *Initiative* : here, the authors make a significant statement that Biocosmology “presents a way of scientific understanding and thinking, as well as a picture of scientific knowledge structure oriented toward the future propelling the construction of the global community with a share future for humanity that are revealed in the development of human civilization as the world undergoes tremendous changes unseen in a century.” [p. 393] For their part, authors of the (**PhThs**)-research point out that “Biocosmology constructs a bio-cosmos where man and nature are integrated and the world is regarded as a complete, self-developing and subjective bio-cosmos,” [p. 269].

It is particularly noteworthy that (**MV&CI**)-authors note a direct link between building the Biocosmological scientific approach and the overriding principle of Taoism. The latter establishes

the inherent Auto-evolvement and successive Auto-ascension (in complexity) of the real physical world (Nature, Kosmos⁹): “that the cosmos is inexhaustibly generating, moving, transforming and evolving in the process.” [p. 262] The authors here cite a key statement from the teachings of Lao Tzu: “Tao generates One, One generates Two, Two generates Three, Three generates ten thousand things.” [Legge, 2008] In the Biocosmological approach, the notion of EvoProcess means the *naturalist*¹⁰ inherent Auto-ascending (in complexity of organization) evolutionary Process of living Nature and Cosmos – Biocosmos. The main gist here is that the naturalistic essence of the *Organicist*¹¹ EvoProcess presented is all quite consistent with the meaning of the Tao in the teachings of Lao Tzu.

As for the criticisms and responses of Chinese scientists to the *Biocosmological Initiative* (and the Biocosmological scientific approach itself) : there are many of them; and all of them have a constructive character, i.e. a wonderful property to stimulate the work of thought – suggestive and make you think; in general, powerfully activate thinking. If you try to answer all of them, then the result will cover many areas of philosophical and scientific knowledge, and the total length would require a book format, but not a single article. Thus, the (RTrC)-author introduces problematic issues and organizes them as subheadings of his article: «1. Is the “transcendental cosmology” followed by modern science a “mechanical cosmology”?; 2. Is the Biocosmology towards which contemporary science is moving Aristotle's?;» [Xiao, 2022].

⁹ Once again, here the notion ‘Kosmos’ is etymologically derived from the Greek term κόσμος – the world order, universe and as an expression of a higher order.

¹⁰ Naturalism and “naturalist”, from Lat. *Natura* (meaning “birth, world order”, Russ. – Природа; and which derives from *nasci*, “to be born, originate”; further from archaic *gnasci*; derived from Praindoevr. *gen-/*gn- “to beget, produce” – see: <https://ru.wiktionary.org/wiki/natur%C4%83>) – and what is the Auto-evolvement, inherent in nature; and where *nature*, in the broadest sense, is the physical world or the Universe. Substantively, in the etymological relation : the terms *natural* and *naturalist* are synonymous with the lexemes *physical* and *physiological*, since “physical” is derived from the Greek φύσις (*phusi*, meaning “nature”), and the latter comes from the Ancient Greek φύω (*phyo* – growing, maturing, developing); thus, initially enclosing in the *natural* and *naturalist* meaning of Auto-evolvement and Auto-ascension of the subject, in the complexity of a living organization.

¹¹ Organon (from the Greek ὄργανον – organ, instrument, appliance, instrumentality), thus the essential *function* (organ’s or living subject’s function), which EvoProcess usefulness is the crucial property for a living subject’s ontogenetic survival and evolvability.

3. Organicism and holism: starting with the definition of leading concepts (“rectification of names”, according to Confucius)

In this connection, it was suggested to highlight first the points of significant misunderstanding of the BCI by Chinese scholars; and, in the course of their characterization, to refer to some important statements of the criticizing or supplementing authors.

We note, firstly, that Chinese authors do not see the all-encompassing meaning of Biocosmology – namely, the cosmological (universal) encompassing the whole of existence as dynamically Auto-evolving. In Biocosmology the concept of *cosmos* (from the Greek κόσμος – world order, universe, world) – here Kosmos means world order and higher order; and that includes all subjects and objects, all entities and strata, and all ongoing organized processes (starting with EvoProcess – Tao) – natural peace-world Auto-movement and Auto-Evolvement (Auto-ascension in the complexity of organization).

At the same time, Chinese scholars use the same terms and concepts that are used in the Biocosmological Organicism. Consequently, the task of clarifying, starting from Organicism and *organic* – the true (genuine) meanings of the common concepts used – is of primary importance.

It is significant that in the history of scholarly knowledge – this goal (principle) is primarily revealed (as fundamental) in the teachings of Confucius. As it is known, the great Chinese philosopher asserted the necessity of realization of the three primary tasks, when there is a need to overcome a complex crisis by a human being and society. The latter arises, for example, during the transition period (as at present), the so-called “time of change”; when society endures sharp transformations in its evolvement. Then, as the genius of Confucius reveals to us a universal plan of action – the subject needs to urgently realize the three most important target tasks: 1. *Rectifying names (notions)*; 2. *Strengthening traditions*; 3. *Acquiring the image of the future*.

At the same time, what immediately draws attention to itself : in the presented (by Chinese scholars) works the concept of holism is actively used; but, at the same time – all this is carried out both in different semantic meanings, or in confusion with the concept of Biocosmological Organicism (that is essentially distinct). Thus, as the (MV&CI)-authors state, “the real world is regarded as a unity from the perspective of holism, but this unity is not a collection of mechanist disparate elements, but a natural and living existence, embodying the standpoints of naturalism and organicism.” [p. 266]

However, in another – (PhThs)-work, holism here is considered already from the perspective of the “environmental philosophy,” thereby “*ecological holism* (italics is our. – **Authors**) implements the

holistic philosophical logic of «one and many», such as Leopold's «*The Land Ethic*», in which all kinds of natural existence including human beings are just citizens or members of the earth community.” [p. 274] As it clearly follows here : the authors, believing themselves on the position of modern holism (accepted in the Western academic community) – Chinese authors actually exclude the *dynamic naturalistic* (Taoist) principle in the Auto-evolvement and Auto-ascension (in complexity) of all Earth Organicist (Auto-moving) evolutionary processes.

Here the authors also argue (but which is sharply opposed both to Aristotle's science and philosophy, in general; and especially in terms of denying the fundamental naturalism of the neo-Aristotelian Biocosmology) that “The integral structure of «one and many» in ancient Greek philosophy that annihilates the role of human subjectivity is replaced by Hegel's unity of opposites, to achieve the goal of equal value between man and nature.” However, as the author further concludes, “we notice that the integrity of «one and many» is incompatible with the integrity of «unity of opposites», while biocosmology tries to make them compatible but we cannot see the necessary basis and basic logic for the compatibility of the two integrities.” [Ibid.]

The latter point of view is fully consistent with the generally accepted (Western) definition of holism, the essence of which can be reduced to its basic ontological principle – “*the whole is always something more than the simple sum of its parts.*”

It is clear from the above that the Western (Transcendentalist) holism that is ingrained in modern academic knowledge – this holism studies Static and Homogeneous (but holistically organized) phenomena; and that corresponds to the category of objective “givenness” (in relation to the external observer studying it). Here the holistic object is usually a social or environmental (ecological) system. At its core, Western holism studies the objective parts of a holistic system and their interrelationships, but where the main principle is that a “holistic system” is “*more than the simple sum of its parts*” (which directly implies something *transcendent* behind the holistic system under study, as a result of the creation of a Demiurge or the endeavors of man and society). In this light, each holistic system serves both to maintain its stability and to realize a constant *monolinear* (on the same grounds and in the same direction) process of its progressive improvement, thus approaching the ideal values of the Common Good (which directly correlates with Plato's philosophical constructions).

In contrast, the Organicist naturalistic principles (natural science foundations) inherent in Biocosmology and Taoism – are practically absent in Western holism.

However, these very principles are fundamental for any subject of the Biocosmos (on a universal scale) – for the realization by each *subject of life* of its/her/his integral ontogenetic Auto-ascension (in the complexity of its organization) : starting with the fundamental principles of Dynamic Bipolarity and Cyclicity – Triadicity (hence Triadological scientific knowledge); but all this is basically lacking in the modern holistic concepts allowed in the academic community of Western science.

But it is the latter (Organicist naturalistic principles) that are fundamental for any *living subject* in its realization of its ontogenetic Biorhythmic and Cyclic Self-evolution – all this aimed at the Entelechist specialized Auto-perfection of the subject and the attainment of its/her/his highest stratum of the *OrganonKosmist* life organization (movement) – for making here the Functionalist (*entelechial*) wholesome contribution, into further Self-growth (in complexity) of the EvoProcess itself.

In the following (NPhBMC)-work we learn a striking piece of information about Aristotle and holism, that “characteristics of holism and scientism revealed by Aristotle's philosophical thought have constructed the basic concepts and frames of thought in the category of organic cosmology.” [p. 386] Finally, the (MHWEx)-judgment reveals that “from a comprehensive perspective, it (biology, – **Authors**) complements reductionism with holism, complements simplicity with complexity, and complements linear description with nonlinear description, which further enriches the overall revelation of the object world.” [pp. 379-380] Naturally, we find it difficult to agree with both author’s judgments.

In fact, to distinguish fundamentally between the concepts of Holism and Organicism – here (first and again) we need to pay special attention to the meaning (and understanding) of the foundational principles of Biocosmology. At the same time, since the latter are really close to the basic principles of Taoism – we hope for their soon and certain perception and understanding by Chinese scholars.

It is important to initially take into account that the fundamental basis of Biocosmology, which studies the integral (singular) living Kosmos, and all its (countless) constituent *subjects of life* : here the principles of Bipolarity and Triadicity (Triadology) are the foundational ones in the organization of the living Kosmos (Biocosmos as a really existing EvoProcess and its peace-world).

The essence of the Triadological principle is that it asserts the Three equal, independent (from each other) and autonomic (in its organization) spheres of life activity – respectively, the Three cosmological Types of scholarly knowledge : two polar (opposite to each other); and the Third, but

equally essential *intermediate*, Integralist *meso*-Type¹², which unites the potentials, energies and forces of the poles (and its own – *meso*-Integralist forces) into a single axis-foundation of the integral wholesome ontogenetic organization of the life activity of an organism-subject.

In lieu of a conclusion. The release of the *Biocosmology Initiative* (BCI, in 2021) triggered a subsequent reaction from scholars – consideration, criticism and discussion of the BCI; and that included active study of the *Initiative* by Chinese scholars (for example, 6 substantive papers studying and evaluating the BCI were submitted to the *Discussion section* and published in the Vol. 12 of the *BCnA*-journal). The BCA community saw this as an important milestone and a valuable resource, and immediately began to promote responsive reflection. At the same time, in this paper, the authors pursued the goal of launching the already organized reflection; and, at first, remembering the great Confucius's strong advice to start a big undertaking with “rectifying names” (clarifying the true meaning of the main concepts and standpoints) in the ongoing discussion and solving the set goals and tasks. Hence, to a rough approximation : but this paper argues that we should correlate (as profoundly complementary) Biocosmology and the teachings of Lao-tzu (Taoism, in general).

References

- Cao, Mengqin Philosophical Thoughts on Biocosmology,” *Biocosmology – neo-Aristotelism* Vol. 12, Nos. 1&2 (Winter/Spring 2022): pp. 272–275. (in the paper is used in the abbreviation “**PhThs**”)
- Chi, Xuefang & Ye, Ping (2022). “The Value of Biocosmology for Today and Some Issues on the Path toward its Practice: Comments on «Addressing the Scientific Community – the *Biocosmology Initiative*,” Vol. 12, Nos 3&4 (Summer/Autumn 2022): pp. 393–403. (in the paper is used in the abbreviation “**VBT&PP**”)
- Jiang, Hongyu & Gao, Han (2022). “Biocosmology: Shaping the Model of Human Experience of the World in the 21st Century,” Vol. 12, Nos 3&4 (Summer/Autumn 2022): pp. 378–382. (in the paper is used in the abbreviation “**MHWEx**”)
- Khroutski, Konstantin S. (2022). “Editing the English version of the Biocosmology Initiative, year 2022,” *Biocosmology – neo-Aristotelism* Vol. 12, Nos 3&4 (Summer/Autumn 2022): pp. 404–418.
- Legge, James (2008 [1891]). *Tao Te Ching or the Tao and Its Characteristics*. The Floating Press.

¹² From Greek μέσος – mesos – making up the middle, median; and μεσότης – the mean, the intermediate, the (golden) middle.

- Randall, John Herman Jr., (1962). "Aristotle's System of the Physical World: A Comparison with his Predecessors by Friedrich Solmsen," *The Philosophical Review*, Vol. 71, No. 4 (Oct., 1962), pp. 520–523.
- Xiao, Xianjing (2022). "From Modern Science to Contemporary Science: Rejection of Transcendental Cosmology and Exploration of the Biocosmology Initiative," *Biocosmology – neo-Aristotelism* Vol. 12, Nos. 1&2 (Winter/Spring 2022): pp. 276–280. (in the paper is used in the abbreviation "RTrC")
- Zhang, Xiuhua & Liu, Jingyuan (2022). "The Methodological Value of the Biocosmology Initiative and Its Contemporary Implications for the Construction of a New Civilization," *Biocosmology – neo-Aristotelism* Vol. 12, Nos. 1&2 (Winter/Spring 2022): pp. 264–271. (in the paper is used in the abbreviation "MV&CI")
- Zhou, Guowen; Wang, Hongyuan & Zhu, Yingyin "Biocosmology: A New Philosophy beyond Traditional Mechanical Cosmology," Vol. 12, Nos 3&4 (Summer/Autumn 2022): pp. 383–392. (in the paper is used in the abbreviation "NPhBMC")