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## DOCTORAL THESIS SUMMARY

# THE RATIONALITY AND UNITY OF CREATION - PRESENT NEOPATRISTIC AND SCIENTIFIC PERSPECTIVE

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The thesis consists of five chapters, preceded by the introduction and followed by general conclusions.

The **INTRODUCTION** addresses the following aspects: the context and argumentation of the theme; the statement of the problem and the objectives of the research; the presentation of the proposed research methodology; the presentation of the structure of the work; the presentation of the current state of the research and of the important authors who address topics relevant to the proposed theme.

**Chapter 1 LOGOS – FUNDAMENTAL ELEMENTS OF THE DEVELOPMENT OF THE CONCEPT IN PHILOSOPHY AND THEOLOGY** analyzes the development of the concept of the Logos, analyzing its philosophical roots and its development in the context of Christian theology.

*1) Introduction to the Concept of Logos*

*Definition of the Logos:* The chapter begins by defining the Logos as a fundamental concept in Greek philosophy and Christian theology. The Logos is interpreted as reason, word, cosmic order, and universal principle of creation.

*Importance of the Concept:* It emphasizes the importance of the Logos in providing a theoretical framework for understanding the rationality and unity of creation, both in an Orthodox philosophical and theological context.

### 2) *The Logos in Greek Philosophy*

*Heraclitus: Heraclitus'* contribution is presented, which introduces the idea of the Logos as universal reason and ordering of the cosmos. Heraclitus sees the Logos as a unifying principle that governs all changes in the universe.

*Socrates* develops the concept of the Logos in the context of the knowledge of truth.

*Plato* identifies the Logos with the world of ideas, where it represents the divine reason that structures reality.

*Aristotle:* The chapter continues with the perspective of Aristotle, who associates the Logos with logic and rational argumentation, considering it essential in the process of knowing and understanding the world.

### 3) *The Logos in Orthodox Theology*

*The Gospel of the Holy Apostle and Evangelist John:* A detailed analysis of the prologue to the Fourth Gospel highlights the central role of the Logos in Christian theology. The Holy Apostle and Evangelist John identifies the Logos with Jesus Christ. The person of the Word of God is becoming incarnate.

*The Fathers of the Church:* The essential contributions of the Fathers of the Church in the early period are examined, such as St. Justin the Martyr and the Philosopher, St. Maximus the Confessor, who develop the theology of the Logos within the Holy Trinity and in relation to Christocentric creation.

### 4) *Philosophical and Theological Synthesis of the Logos*

*Philosophy-Theology Intersection:* The chapter presents a synthesis of how the concept of Logos unites classical Greek philosophical thought and Jewish theology in the Hellenistic environment, providing a coherent vision of the rationality and unity of creation. The continuity and development of the concept throughout history is emphasized, highlighting its relevance to Christianity.

**Chapter 2. RATIONALITY AND UNITY OF CREATION IN THE LIGHT OF CURRENT SCIENCE – MACROCOSM analyzes the concepts of rationality and unity of creation from the perspective of contemporary science, with a special focus on large-scale structures and phenomena (macrocosm).**

#### 1) *Introduction to the Concept of Macrocosm*

*Defining the Macrocosm:* The chapter begins by defining the macrocosm, by referring to the observable universe, including galaxies, galaxy clusters, and the large-scale structure of the



universe. It emphasizes the importance of studying these structures in order to understand the rationality and unity of creation.

## 2) *Standard Model of Cosmology*

*Big Bang:* The Big Bang theory is presented as a standard model of the origin of the universe, explaining how this theory provides a coherent and rational picture of the evolution of the universe from a very dense and hot stage to its current state.

*Expansion of the Universe:* The continuous expansion of the universe is discussed, supported by observations of redshift of light from distant galaxies, which indicates a unity and order in macrocosmic development.

## 3) *The Large-Scale Structure of the Universe*

*Structure Formation:* It looks at the formation and development of large-scale structures in the universe, including galaxies and galaxy clusters. It discusses the physical processes that led to the formation of these structures and the role of dark matter and dark energy in this context.

*Unity in Diversity:* The chapter highlights how the diversity of macrocosmic structures is governed by the same fundamental laws of physics, suggesting a profound unity in the diversity of creation.

## 4) *Physical Laws and Fundamental Constants*

*Universal Constants:* The importance of physical constants (such as the gravitational constant, the speed of light, etc.) in maintaining order and coherence in the universe is emphasized. It discusses how these constants are *fine-tuned* to allow for the existence of complex structures and life.

*Laws of Nature:* It is emphasized that *the laws of nature*, which govern the behavior of the macrocosm, reflect the rationality, unity and intelligibility of creation. The consistency of these laws throughout the existence of the entire observable universe is emphasized.

## 5) *The Connection Between the Rationality of Creation and Contemporary Science*

*Rationality of Creation:* It is discussed how current scientific discoveries indicate the existence of rationality and unity of creation, by the fact that the universe functions according to logical, coherent and intelligible principles.

*Interdependence of Structures:* The chapter explores the interdependence between the various cosmic structures, which indicates an intrinsic unity of creation on a large scale.

## 6) *Philosophical and Theological Implications*

*Philosophical Implications:* The relationship between cosmological discoveries and philosophical questions about the meaning and purpose of the universe is analyzed. It discusses

how the rationality and unity observed in the macrocosm can be interpreted as indications of a divine order and intention.

*Theological Perspective:* The Orthodox theological perspective on the macrocosm is explored, emphasizing the synergistic complementarity between contemporary science and the Orthodox Christian vision of an orderly and rational creation, reflecting *the Logos*.

#### 7) *Conclusions*

*Unity and Rationality:* The chapter concludes that the study of the macrocosm provides compelling evidence for the rationality and unity of creation. The large-scale structure of the universe and the laws that govern it indicate the existence of a rational plan that is compatible with the Orthodox theological view of Christocentric creation.

*Science-Theology Dialogue:* The importance of ongoing dialogue between science and theology is emphasized in order to deepen our understanding of the universe and our place in it.

**Chapter 3. RATIONALITY AND UNITY OF CREATION IN THE LIGHT OF CURRENT SCIENCE – MICROCOSM explores the concepts of rationality and unity of creation from the perspective of contemporary science, focusing on small-scale structures and phenomena (microcosm).**

#### 1) *Introduction to the Concept of Microcosm*

*Defining the Microcosm:* The chapter begins with a clear definition of the microcosm, including elementary particles, atoms, and molecules. It emphasizes the importance of understanding these entities in order to decipher the foundations of the rationality and unity of creation at the microscopic level.

#### 2) *Elementary Particle Physics*

*Standard Model:* The Standard Model of particle physics is presented, which describes fundamental interactions and elementary particles. The rationality of this model and the unity of the physical laws governing subatomic particles are discussed.

*Symmetry and Conservation:* The chapter examines the principles of symmetry and the laws of conservation (energy, momentum, charge, etc.) and their role in maintaining order at the subatomic level, emphasizing the unity of creation.

#### 3) *Quantum Mechanics*

*Fundamental Principles:* The fundamental principles of quantum mechanics are explored, including wave-particle duality, Heisenberg's uncertainty principle, and the wave function. It discusses how these principles reflect a rational order at the microscopic level.

*Quantum interconnection:* The phenomenon of quantum entanglement and its implications for the unity of creation is analyzed, demonstrating how particles can remain interconnected at great distances.

4) *Chemistry*

*Atoms:* The chapter examines how atoms are formed. The rationality of these processes and the unity of the chemical structure of matter are discussed.

5) *Thermodynamics and Statistics*

*Laws of Thermodynamics:* The chapter addresses the laws of thermodynamics and their role in describing the behavior of physical systems. The importance of these laws for understanding balance and irreversibility in natural processes is emphasized.

*Information Theory:* The application of information theory to physical and biological systems is discussed, providing insight into the rationality and informational unity of the microcosm.

6) *Philosophical and Theological Implications*

*Philosophical Implications:* The relationship between the discoveries in the microcosm and philosophical questions about the nature of reality and the foundation of rationality is analyzed. It discusses how the structures and laws of the microcosm can be interpreted as clues to a rational plan.

*Theological Perspectives:* The chapter explores the Orthodox theological perspective on the microcosm, emphasizing the synergistic complementarity between scientific discoveries and the Orthodox theological vision of an orderly and rational creation.

7) *Conclusions*

*Unity and Rationality:* In this chapter it is emphasized that the study of the microcosm provides convincing evidence for the existence of rationality and unity of creation. The structure and behavior of elementary particles, molecules, and thermodynamic systems indicate a profound order and fundamental coherence of the universe at the microscopic level.

*Science-Theology Dialogue:* The importance of the ongoing dialogue between science and Orthodox theology is emphasized, in order to deepen our understanding of reality and our place in the universe.

**Chapter 4. THE CURRENT DIALOGUE BETWEEN THEOLOGY AND SCIENCE IN THE COMMON FIELD OF COSMOLOGY** explores how Orthodox theology and contemporary science interact and converge synergistically in the field of cosmology. This chapter examines various perspectives, challenges, and achievements that

**arise when Orthodox theology and modern cosmology share their discoveries and interpretations.**

1) *Introduction of the dialogue*

*Historical Context:* The chapter begins by providing elements of the history of the dialogue between theology and science, emphasizing the turning points in which these two fields intersected and subsequently developed divergently or convergently.

*Purpose and Importance:* The importance of dialogue between Orthodox theology and science is emphasized, especially in the field of cosmology, where questions about the origin and structure of the universe have profound implications for both fields.

2) *Modern Cosmology*

*Big Bang theory:* The chapter explores the current standard cosmological model that includes the Big Bang to explain the origin and development of the universe. Theoretical and observable scientific evidence supporting this model is discussed, such as the cosmic microwave background radiation and redshift of galaxies.

*Lambda-CDM model:* The standard cosmological model Lambda-CDM (Lambda Cold Dark Matter) is presented, which describes the composition and development of the universe, emphasizing the importance of dark matter and dark energy.

3) *The Orthodox Theological Perspective*

*The Doctrine of Creation:* The chapter examines Orthodox theological teachings on creation, emphasizing the conception of a universe created by God out of nothing (*creatio ex nihilo*) and maintained by God's will, including maintaining the laws of nature.

*Christocentrism of Creation:* The Christocentric principle of creation is discussed, in which Jesus Christ is the foundation, meaning, and purpose of all creation. This theological principle is compared and integrated with modern cosmological discoveries, understood according to the anthropic principle of cosmology and physics.

4) *Points of Convergence*

*Origin of the Universe:* A major synergistic point of convergence is the discussion of the origin of the universe. Both standard scientific cosmology and Orthodox theology are interested in how the existence of the universe began, providing complementary perspectives.

*Order and Rationality:* The chapter emphasizes that both theology and science recognize a rational order in the structure of the universe. Orthodox theology attributes it to God, while science describes it by precise natural laws.

### 5) *Challenges and Critical Discussions*

*The Problem of Causality:* It explores the challenges posed by the Big Bang theory to understanding causality and the initial moment of creation. The question of "what was before the Big Bang" and how Orthodox theology can answer this question is discussed.

*Development of the Universe:* The chapter also addresses discussions about the long-term development of the universe, including its ultimate fate and the involvement of the divine plan in this process.

### 6) *Future Prospects*

*Interdisciplinary Collaborations:* It emphasizes the importance of interdisciplinary collaborations between Orthodox theologians and scientists to explore more deeply common questions about the universe.

### 7) *Conclusions*

*Theology-Science Complementarity:* The chapter concludes that theology and science, although different in their methods and purposes, can provide complementary perspectives on the universe. The dialogue between them can lead to a deeper and more holistic understanding of reality.

*Importance of Dialogue:* The importance of continuing the dialogue between Orthodox theology and science, especially in the field of cosmology, is emphasized in order to answer fundamental questions about the existence, purpose and order of the cosmos.

**Chapter 5. The Christocentrism of Creation – Current Landmarks approaches *the Christocentrism* of creation through the essential Orthodox scientific and theological concepts. This chapter examines themes related to the contingency of the Big Bang, the contingency of the laws of science, the irreversibility of time, *the anthropic principle*, *fine-tuning*, and the *recapitulation* (renewal) of all things in Christ, emphasizing how they converge in the *Christocentric perspective* of creation.**

#### 1) *The Big Bang contingency*

The Big Bang, as the beginning moment of the universe, is seen as a contingent act, not being determined by any necessity. From the perspective of Orthodox theology, it points to a transcendent Creator who initiates creation out of nothing (*creatio ex nihilo*), and then maintains it according to His free will. *Christocentrism* adds that this creation out of nothing is realized through and for Jesus Christ, the human Logos (cf. Colossians 1).

*Significance of Contingency:* In Orthodox theology, the contingency of the Big Bang is interpreted as a free act of God's will, emphasizing the unconditional nature of the Holy Trinity's

love for *Christocentric* creation. The universe is not a product of necessity, but of a planned intention of God.

*Christocentric implications:* All creation, beginning with the Big Bang, is aimed at completion and recapitulation (renewal) in Christ (cf. Ephesians 1:10). Thus, Christ is the Alpha and Omega, the beginning and end of creation, giving meaning, purpose, and unity to the entire creative process of God.

#### 2) *The Contingency of the Laws of Science*

And the Laws of Science, which govern the behavior of the universe, are seen as contingent. These are not existing by themselves, but reflect the order and rationality imposed by the Creator.

*Order and Rationality:* From a Christocentric perspective, these laws are expressions of *the Logos*, which structures and maintains the universe. The rationality of the laws of science reflects divine rationality, indicating that the universe is intelligible, planned, and ordered, having meaning and purpose.

*Metaphysical Origin:* The contingency of the laws of science suggests that they have a metaphysical/transcendent origin, namely the divine intention and will. Jesus Christ, the divine Logos, is the source of this order, and the author insists here on the interdependence between Orthodox theology and science in understanding the cosmos.

#### 3) *The Irreversibility of Time*

The irreversibility of time is a fundamental aspect of our reality, reflected in the second law of thermodynamics and in the human experience of the passage of time.

*Cosmological and Theological Implications:* From a Christocentric perspective, the irreversibility of time indicates the meaning of God's plan for creation, leading the history of the development of the universe to an ultimate goal, Jesus Christ. This irreversible process indicates a teleological direction in creation, oriented towards its fulfillment in *the Logos incarnate*, Jesus Christ.

*Existential Aspects:* For Orthodox theology, time is not only a physical measure, but also a dimension in which the divine plan and the recapitulation (renewal) of all things in Jesus Christ unfold. Time is thus a means through which the divine will and providence are manifested.

#### 4) *The Anthropic Principle*

The anthropic principle indicates the adjustment of the physical laws and constants of the universe so as to allow the existence of intellectual human life.

*Convergence with Theology:* This principle constitutes an argument for the existence of an intelligent Creator who established these precise conditions, necessary for the emergence and

maintenance of human life. From the point of view of *Christocentrism*, this fine-tuning is a reflection of God's intention to create a universe that is inhabited by human beings capable of an intellectual relationship with God.

*Rationality and Meaning:* The anthropic principle emphasizes the rationality and teleology of creation, indicating that the universe is built for a specific purpose. In Orthodox theology, this purpose is Jesus Christ, the Logos incarnate, who is the reason, meaning and purpose of creation.

5) *Fine-tuning*

The fine-tuning of the universe refers to the infinitely tending precision of the conditions necessary for intellectual human life, indicating the existence of an intelligent plan.

*Highlighting the Divine Plan:* Fine-tuning is a powerful argument for the planned existence of the universe, consistent with the *Christocentric principle* of the universe created and upheld by Jesus Christ. The precision of these conditions reflects the order, meaning, purpose, unity, and rationality of *the Logos*.

*Orthodox Theology and Fine Tuning:* In Orthodox theology, this precision is not accidental, but reflects the divine will and intention. *It is the Logos* who makes and maintains this adjustment, indicating a creation that is actively directed by God toward the *Christocentric* goal.

6) *"All things were done through him and for him" (Colossians 1:16) and the Recapitulation in Christ (Ephesians 1:10)*

These Bible verses emphasize that all things were created through and for Christ and that all things will be recapitulated (renewed) in Him.

*Renewal Theology:* Recapitulation (renewal) in Christ affirms that history and creation find their ultimate fulfillment and unity in Christ. This concept is central to Orthodox theology, which sees all creation as oriented towards its renewal and fulfillment in Christ Jesus, *the* human Logos.

*Implications for the Theology-Science Dialogue:* Orthodox theology provides a framework in which scientific discoveries are understood as parts of a coherent and rational whole. *Christocentrism* offers a unitary vision of reality, where science and theology are complementary.

## The possibility of knowing the *Logos* from His creation through science

The position of the Orthodox Church regarding the relationship between theology and science is affirming their distinction and complementarity<sup>1</sup>, in accordance with Tradition.

St. Maximus the Confessor emphasizes that in creation there are three essential laws. " By 'general laws' I mean the natural law, the scriptural law, and the law of grace<sup>2</sup>."<sup>3</sup> The first law is fundamental to the entire cosmos, ensuring its existence towards the *Christocentric* scope. By contemplating nature (θεωρία Φύσικῆ) with all its constituent elements, motivated by knowing and living by the Truth, one can gain a natural knowledge of God, His justice, wisdom, and goodness. The second law is contained in the Scriptures, more precisely in the Old Covenant. It presents God's relationship with men in history, being summarized in the laws and commandments given to men by God. The third law corresponds to humanity, the *Logos*, and to His saving and deifying work. It is the spiritual law of Christ (Gal 6:2).

*The Logos* is the author of all three laws, being present in them in different degrees. The three laws present the economy of creation, salvation and deification of man. They correspond to the progressive revelation of *the Logos* to the people and the progressive development of their degree of knowledge of God, towards fullness in Jesus Christ. Thus, through the first law we arrive at the second, and through this at the third, which ensures the fullness of the union and knowledge of God. So, the spiritual law includes the other two previous ones, being their fulfillment in the mystery of humanity of the *Logos*.

The Holy Apostle Paul teaches in the Epistle to the Romans that human beings are created as thinking (*logikoi*) beings, thus having the possibility of knowing God through the study of creation:

"For since the creation of the world [κόσμου], His invisible attributes are clearly seen

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<sup>1</sup> IPS Ierotheos VLACHOS, *Bioetică și bioteologie*, trad. Ierom. Teofan Munteanu, București, Cristiana, 2013, pp. 67-69

<sup>2</sup> Fr. Mazimos CONSTAS, Note 83, at Saint Maximus the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 64", in *The fathers of the Church, A New Translation*, Vol. 136, Trans. Fr. Mazimos Constan, Holy Cross Greek Orthodox School of Theology, Washington, D.C., The Catholic University of America Press, 2018, p. 510; Cf. above, Qu. 39; and below, Qu. 65.14, and Qu. 65, schol. 19.

<sup>3</sup> Saint Maximus the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 64", in *The fathers of the Church, A New Translation*, Vol. 136, Trans. Fr. Mazimos Constan, Holy Cross Greek Orthodox School of Theology, Washington, D.C., The Catholic University of America Press, 2018, p. 510; Sfântul Maxim Mărturisitorul, *Qu. A. T. 64*; in PG 90, 724 C [FR3, Editura Institutului Biblic și de Misiune al Bisericii Ortodoxe Române, 2009, p. 459.]



[καθορᾶται]<sup>4</sup>, being understood [νοούμενα]<sup>5</sup> by the things that are made, even His eternal Power [δύναμις] and Godhead [θειότης], so that they are without excuse." (Rom 1:20)<sup>6</sup>

St. Maximus the Confessor teaches the following about "His invisible attributes" (Rom 1:20), emphasizing the importance of scientific endeavor ("contemplate cognitively"):

"The principles of beings - which were prepared before the ages in God, in a manner known

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<sup>4</sup> The term "*καθορᾶται*" (*kathoratai*) means "to see clearly" or "to perceive distinctly". The meaning of the term "Καθορᾶται" in this verse is:

a) *To perceive clearly*: The root *ὁράω* (*horaō*) means "to see" or "to observe". The prefix *κατά* (*kata*) intensifies the action, thus *καθορᾶται* means "to see clearly" or "to perceive distinctly". It is a term that indicates a deep and clear perception, not just a superficial observation.

b) *Inner Perception*: In the theological context, *καθορᾶται* implies a deep understanding, which goes beyond mere visual perception and refers to an inner, intellectual knowledge.

<sup>5</sup> The term *νοούμενα* (*nooumena*) derives from the Greek verb *νοέω* (*noeō*), which means "to perceive", "to understand" or "to observe with the mind". The history of this term is related to the development of Greek philosophical thought and has been used in various contexts to describe the process of intellectual knowledge and perception.

*Ancient Greece*

a) *Heraclitus* emphasized the importance of the Logos and intellectual perception. Although he does not explicitly use the term "nooumen", the concept of understanding through the "logos" is fundamental to his philosophy.

b) *Anaxagoras*. *Nous*: Anaxagoras introduced the concept of nous (νοῦς), which is the ordering and intelligent principle of the universe. This nous was responsible for the order and structure of the cosmos and could be understood through intellectual contemplation.

c) *Plato*. *Noesis*: Plato distinguished between the sensible world (of sensory perception) and the intelligible world (of intellectual perception). *Noesis* (νόησις) is the act of pure, direct knowledge of ideal forms, an essential concept in the Platonic theory of knowledge.

d) *Aristotle*. *Nous*: Aristotle continued the tradition of using the term nous, referring to the active intellect, capable of understanding the essences of things. He distinguished between the passive and the active intellect, where the active is the one who perceives and understands.

*Hellenistic Philosophy*

a) *The Stoics*. *Logos*: The Stoics took up the concept of logos as the divine reason that pervades the entire universe. They believed that men could understand the universal *Logos* through their individual reason.

*Judeo-Hellenistic Philosophy*

a) *Philo of Alexandria*. *Logos*: Philo combined Greek philosophy with Jewish theology, using the term *Logos* to refer to the divine reason by which God created and maintains the universe. *Noumen* would be involved in the process of understanding this Godly "logos".

*Christianity*.

a) *Saint Paul*. *Nooumen*: In his epistles, St. Paul uses forms of the verb *noeo* to emphasize the act of perceiving or understanding God's Truth, such as in Hebrews 11:3 and Romans 1:20, where he describes understanding creation and God's attributes through practicing faith and observation.

*Modern Philosophy*

a) *Immanuel Kant*. *Noumenon*: Kant revitalized the term in the form *noumenon*, which means thing in itself, distinct from phenomenon (thing as it appears to the senses). For Kant, *noumenon* is the reality that exists independently of human perception and is inaccessible to direct knowledge.

The term *nooumen* and its derived forms have evolved significantly throughout the history of philosophy, from the description of the process of intellectual understanding in ancient Greek thought, to the notion of *noumenon* in Kant. Over time, this concept has been central to discussions about the nature of knowledge, perception, and reality.

<sup>6</sup> *The Orthodox Study Bible*, Prepared under the auspices of the Academic Community of St. Athanasius Academy of Orthodox Theology, Elk Grove, California, USA, Thomas Nelson Publishers, 2008.

only to Him, and which divine men customarily call ‘good will’<sup>7</sup>—are invisible in themselves, yet are ‘clearly visible in the things that are made,’ when, that is, they are seen with the eyes of the intellect<sup>8</sup>. For when with true understanding we contemplate cognitively all of God’s creatures according to their nature, they secretly announce to us the principles by which they were created, disclosing in themselves the divine intention for each one, consistent with the words: ‘The heavens declare the glory of God, and the firmament proclaims the work of His hands’<sup>9</sup>. As for God’s ‘eternal power and divinity,’ this is His providence that holds beings together, and His providential activity that divinizes those under its care. [...] For just as from created beings we believe in the existence (in the truly proper sense) of God, so too, from the essential differences of beings according to their specific forms, we learn of His Wisdom, which is naturally inherent in His essence, and which holds beings together. And, again, from the essential motion of beings according to their specific forms, we learn of His Life, which is naturally inherent in His essence, and which brings completion to beings. And from the wise contemplation of creation, we apprehend the principle concerning the Holy Trinity, I mean of the Father and of the Son and of the Holy Spirit, because the ‘eternal power’ of God is the Word, since He is consubstantial, and the ‘everlasting divinity’ is the consubstantial Spirit<sup>10,11</sup>.

St. Maximus the Confessor emphasizes the duty of man to praise God through the understanding of the reasons of creatures, obtained also through scientific study, as much as possible:

"When we bring to the Lord the spiritual principles we have discerned in creation, we bring

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<sup>7</sup> Fr. Mazimos CONSTAS, Note 2, at Saint Maximus the Confessor, “On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 13...”; A reference to Dionysios, DN 5.8 (188, lines 8–9; 824C), a passage that Maximus cites in Amb. 7.24 (DOML 1:106–109).

<sup>8</sup> Fr. Mazimos CONSTAS, Note 3, at Saint Maximus the Confessor, “On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 13...”; That is, the *logoi* are visible in creation through natural contemplation

<sup>9</sup> Fr. Mazimos CONSTAS, Note 4, at Saint Maximus the Confessor, “On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 13...”; Ps 18.1. Maximus comments on this verse in Amb. 10.20 (DOML 1:179–81).

<sup>10</sup> Fr. Mazimos CONSTAS, Note 4, at Saint Maximus the Confessor, “On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 13...”; In this adumbration of the Trinity in creation, the existence of creatures is understood as an image or reflection of God the Father; their organization into unity and diversity as an image of the Son (as Wisdom); and their movement and life as an image of the Holy Spirit; cf. Amb. 10.39, where the contemplation of nature reveals to the saints that “the <divine> cause exists, is wise, and is something living, from which they learned the divinizing and salvific principle of the Father, the Son, and the Holy Spirit . . . into which they were piously initiated with respect to the mode of God’s existence” (DOML 1:209); and the discussion in Polycarp Sherwood, “The Triune God,” in idem, St. Maximus the Confessor: The Ascetic Life, The Four Centuries on Charity (New York: Newman Press, 1955), 37–45.

<sup>11</sup> Saint Maximus the Confessor, “On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 13...”, pp. 123 - 124; Sfântul Maxim Mărturisitorul, „Răspunsuri către Talasie, 13”, în *Filocalia sau culegere din scrierile Sfinților Părinți care arată cum se poate omul curăța, lumina și desăvârși*, vol. III, Ed. Institutului Biblic și de Misiune a Bisericii Ortodoxe Române, București, 2009, pp. 74-75.

him 'offerings,' for by nature He has no need of any of these things<sup>12</sup>. For we do not bring the principles of beings to Him as if He were in need of them as others would be, but rather so that we might, on behalf of all His creatures, praise Him in song for all that He has given us."<sup>13</sup>

The spiritual man, accustomed to the practice of the faith (*pistei*), focused on the Eucharist, receives as a gift through the contemplation of creatures, the understanding of "the sustaining principles of faith beyond rational demonstration", and this spiritual understanding received as a gift from God, although it does not need any rational scientific demonstration, does not in any way imply the exclusion of the effort of the rational scientific study of creatures.

"Insofar as an 'offering' is also something given to those who have previously brought forward nothing, the intellect engaged with knowledge receives 'offerings' from the contemplation of beings, and brings them to the Lord. These offerings, which the intellect both receives and gives, are the sustaining principles of faith beyond rational demonstration; a faith to which no one has ever brought anything, insofar as a person naturally beholds his own Creator, proclaimed to him by creation, without any of the technical contrivances of various arguments<sup>14</sup> - for what could one possibly bring forward that would be equal to faith, as if his faith were due to his own efforts, and not an offering to him from God? The same intellect also receives the 'gifts' of the natural laws of beings, to the extent that it imitates their modes of existence."<sup>15</sup>

Thus, all the human beings are called to praise God also through the investigation of the reasons of creatures, motivated by knowing the Truth, which can be done either through scientific research, or through spiritual practice, or, ideally, through the synergistic combination of these ways.

"Having granted existence to the entire visible creation, God did not leave it to be moved about solely by means of sense perception, but implanted, within each of the species comprising creation, spiritual principles of wisdom and modes of graceful conduct. His aim was not only that mute creations should loudly herald Him as their Creator, proclaimed by

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<sup>12</sup> Fr. Mazimos CONSTAS, Note 9, at Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 51..."; Cf. Ps 15:2.

<sup>13</sup> Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 51...", p. 307; Sfântul Maxim Mărturisitorul, "Răspunsuri către Talasie, 51...", p. 245.

<sup>14</sup> Fr. Mazimos CONSTAS, Note 10, at Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 51..."; See, Qu. 5.2, where sustaining life "through artifice or through some other contrivance" is said to be characteristic of human life after the fall of Adam.

<sup>15</sup> Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios...", pp. 307-308; Sfântul Maxim Mărturisitorul, "Răspunsuri către Talasie, 51...", p. 245.

means of the principles of the things that came into being, but also that the human person, being tutored by the natural laws and ways of visible realities, should easily find the road of righteousness, which leads to Him<sup>16</sup>. And this in fact was the sign of God's extreme goodness, namely, that He did not simply establish the divine and incorporeal essences of the intelligible hosts as images of divine glory -each one proportionately receiving, as much as is permitted, the inconceivable splendor of the unapproachable beauty - but He also intermingled even among sensory creatures, who are greatly inferior to the intelligible essences, resonances<sup>17</sup> of His own magnificence. These have the power to bear and convey the human intellect unerringly to God, so that it comes to reside beyond the whole of visible reality, planting its foot on the extremity of blessedness and on all the intermediaries it left behind when it passed through them and so completed its journey. And not only this, but also so that none of those who 'worship creation rather than the Creator'<sup>18</sup> would have ignorance as a ground for justifying himself, hearing creation heralding its own Creator more clearly and distinctly than any other voice".<sup>19</sup>

St. Paul tells us that the Gentiles (*ethnē*) have the opportunity to know *Logos* through the laws of nature, which can be understood through honest scientific study, motivated by the knowledge of the Truth and the love of Wisdom, which implies the choice of a virtuous rational life, according to the conscience, helped by *Logos*.

"For not the hearers of the law [νόμου] are just [δίκαιοι] in the sight of God, but the doers of the law will be justified [δικαιωθήσονται]; for when Gentiles [ἔθνη], who do not have the law [νόμον], by nature do the things in the law, they without having a law are their own law; they show the deed of the written law [γραπτὸν], these, although not having the law, are law to themselves, who show the work of the law written in their hearts, their conscience [συνειδήσεως], also bearing witness, and between themselves their thoughts [λογισμῶν]

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<sup>16</sup> Fr. Mazimos CONSTAS, Note 2, at Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 51..."; Cf. above, Qu. 39, and below, Qu. 64 and 65.

<sup>17</sup> Fr. Mazimos CONSTAS, Note 3, at Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 51..."; ἀπήχημα (pl. ἀπηχήματα) is a term well attested in later Neoplatonism, where it is a sonic or auditory metaphor for the doctrine of emanation and participation (normally described as a diffusion of light), and usually designates a faint or distant echo of its source; cf. Proclus, *Platonic Theology* (ed. Henri Dominique Saffrey and Leendert Gerrit Westerink [Paris: Belles Lettres, 1968], 1:124, line 18); idem, *Commentary on Plato's Timaeus* (ed. Ernst Diehl [Teubner, 1906; repr. 1965], 3:158). The term appears among Christian writers, such as Eusebios of Caesarea, *Commentary on the Psalms* (PG 23:1288A); but especially in Dionysios, who is undoubtedly the bridge from Proclus to Maximos; e.g., DN 4.4 (147, line 12; 697D); DN 4.20 (166, line 1; 720A); DN 4.20 (167, lines 4–5; 720C); DN 7.2 (195, lines 16–17; 868C); and CH 2.4 (15, line 4; 144C). For a related use of ἀπηχήματα, see Maximos, QD. 119 (CCSG 10:87, lines 18–21).

<sup>18</sup> Fr. Mazimos CONSTAS, Note 4, at Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 51..."; Rom 1:25.

<sup>19</sup> Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 51...", pp. 305-306; Sfântul Maxim Mărturisitorul, "Răspunsuri către Talasie, 51...", pp. 243-244.

accusing or else excusing them." (Rom 2:13-15)<sup>20</sup>

### **The scientific endeavor must be motivated by knowing the Truth and the love of Wisdom**

St. Maximus the Confessor emphasizes that the man who loves wisdom, lives virtuously, seeks the Truth, and intellectually investigates the laws of nature, which can be rationally understood, is perfected by Jesus Christ, *Logos* incarnated.

"Clearly, then, the nature of visible realities naturally has spiritual principles of wisdom and modes of graceful conduct implanted within it by the Creator. When, like the great king Hezekiah, every intellect naturally crowned with virtue and knowledge attains to rule over Jerusalem<sup>21</sup>, that is, over the state in which one beholds only peace, which is a condition free of every passion - for Jerusalem means 'vision of peace' - such an intellect, I say, has all creation at its command, by means of all the species of which it is comprised. Through the mediation of the intellect, creation brings to God, like offerings<sup>22</sup>, the spiritual principles of knowledge. To the intellect, creation brings, like gifts, modes for the realization of virtue, which exist within creation, according to the natural law. Through both, creation welcomes and receives the one who is able mightily to esteem both, I mean the philosophical mind perfected in the principle of contemplation and in a life of practice".<sup>23</sup>

In the Epistle to the Hebrews (11:3) Saint Apostle Paul states:

"By faith [πίστει]<sup>24</sup> we understand [νοοῦμεν]<sup>25</sup> that the worlds [αἰῶνας]<sup>26</sup> were framed

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<sup>20</sup> *The Orthodox Study Bible*, Prepared under the auspices of the Academic Community of St. Athanasius Academy of Orthodox Theology, Elk Grove, California, USA, Thomas Nelson Publishers, 2008.

<sup>21</sup> Fr. Mazimos CONSTAS, Note 5, at Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 51..."; Cf. 4 Kgs 18:1-2.

<sup>22</sup> Fr. Mazimos CONSTAS, Note 6, at Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 51..."; The role of the human person in the cosmic order has a strong liturgical and indeed Eucharistic character, highlighted by the language of "offering," which bears comparison with Byzantine liturgical texts. In the theology of St Maximos, this was the "priestly" role that Adam was called to perform, returning creation to God, but which he failed to do; cf. Amb. 41.2-10 (DOML 2:103-15).

<sup>23</sup> Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios...", pp. 306-307; Sfântul Maxim Mărturisitorul, "Răspunsuri către Talasie, 51...", pp. 243-244.

<sup>24</sup> The term *πίστει* (*pistei*) is commonly translated as "faith," meaning firm trust in God and His promises. It is a trust that goes beyond empirical and rational knowledge, based on God's revelation in Sacred Scripture and Tradition.

<sup>25</sup> The term *νοοῦμεν* (*nooumen*) used by St. Paul in this verse and in Romans (1:20) is a form of the Greek verb *νοέω* (*noeó*), which means "to perceive", "to understand" or "to observe with the mind". This verb and its derived forms are related to *νοῦς* (*noûs*), the Greek term for "mind" or "intellect."

<sup>26</sup> The term *αἰῶνας* (*aiōnas*) is often translated as "ages" or "universe". The meaning of the term is that of the universe in its multitude of dimensions.

[κατίσθαι]<sup>27</sup> by the word of God, so that the things which are seen [βλεπόμενον]<sup>28</sup> were not made [γεγονέναι]<sup>29</sup> of things which are visible [φαινομένων]<sup>30</sup>." (Heb 11:3)<sup>31</sup>

In other words, considering the meaning of the terms used "By practicing faith (*pistei*) we understand (*nooumen*) that the universe (*aiōnas*) was created (*katērtisthai*) by the word of God, so that everything that is seen (*blepomenon*) was not made (*gegonenai*) of anything that is visible (*phainomenōn*)".

The theological significance of this verse can be summarized as follows:

- a) *Faith and Reason*: The verse says that the act of faith/trust is aimed at understanding a reality that goes beyond what is directly accessible through the senses or reason. Faith/Trust reveals the truth about the origin of the universe, which cannot be known by direct observation of visible phenomena.
- b) *Creatio ex nihilo*: In Christian theology, this verse is essential to the dogma of creation out of nothing (*creatio ex nihilo*). The physical world was not created from anything material pre-existent, but through and for the *Logos* (Col1,16).
- c) *The Power of God's Word (Logos)*: This verse highlights the central role of God's Word (*Logos*) in the act of creation. Everything that exists visibly in the universe has been brought into existence (being) through the Word (*Logos*) of Almighty God.

In the discourse in the Areopagus, St. Paul says:

"So that they should seek the Lord, in the hope that they might grope [ψηλαφήσειαν] for Him

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<sup>27</sup> The term *κατηρτίσθαι* (*katērtisthai*) is commonly translated as "has been formed" or "has been drawn up". The verb *κατηρτίζω* (*katartizo*) means "to put in order", "to prepare" or "to prepare". In its passive form the term *κατηρτίσθαι*, designates something that has been arranged, formed or created, and in the theological context of creation, the meaning is that of "to be drawn up" or "to be brought into existence" in a planned and ordered state.

<sup>28</sup> The term *βλεπόμενον* (*blepomenone*) refers to material things that are visible or perceptible through the physical senses.

<sup>29</sup> The term *γεγονέναι* (*gegonenai*) comes from the verb "γίγνομαι" (*gignomai*), which means "to become", "to be done", "to happen" or "to happen". In the perfect passive context "γεγονέναι", the term indicates that something has been made or has become, emphasizing the passage from non-existence to existence, from potentiality to reality. In the theological context of creation, it highlights that the universe was made by God through a creative act, out of nothing.

<sup>30</sup> The term *φαινομένων* (*phainomenōn*) refers to "things that are seen" or "visible", being derived from the verb *φαίνω* (*phainō*), which means "to appear" or "to become visible".

<sup>31</sup> *The Orthodox Study Bible*, Prepared under the auspices of the Academic Community of St. Athanasius Academy of Orthodox Theology, Elk Grove, California, USA, Thomas Nelson Publishers, 2008.

and find Him, though He is not far from each one of us." (Acts 17:27)<sup>32</sup>

With regard to this verse of Holy Scripture, where St. Paul uses the verb ψηλαφάω (groping, touching, palpating), St. Maximus the Confessor *teaches the importance of synergistic knowledge of the Logos "by having chosen the spirit of Scripture, the logos of nature, and his intellect, and by uniting them indissolubly to each other, he found God - in the sense that he came to know God, as much as this was necessary and possible - in the intellect, in the logos, and in the spirit"*:

"Whoever does not look upon all the visible and corporeal worship of the law through sense perception alone, but carefully examines with his intellect each of the visible symbols, thoroughly apprehending the divinely perfect logos hidden in each, finds God in that logos. In this way he rightly uses the power of his intellect to 'grope' through the material ordinances of the law, as if groping through a heap of rubbish<sup>33</sup>, hoping to find buried somewhere 'in the flesh of the law'<sup>34</sup> the pearl of the *logos*, which utterly escapes sense perception<sup>35</sup>. To be sure, the one who does not limit his perception of the nature of visible things to what his senses alone can observe, but who in his intellect wisely searches after the logos in every creature, likewise finds God, for from the manifest grandeur of beings he learns who is the Cause of their being. Inasmuch as the ability to make distinctions is the characteristic mark of the one who 'gropes after God,' it follows that the one who examines the symbols of the law with knowledge, and who contemplates the visible nature of beings with true understanding of its cause, makes distinctions within Scripture, nature, and himself. In Scripture, he distinguishes between the letter and the spirit<sup>36</sup>; in nature, between its inner logos and its outward manifestation; and in himself, between intellect and sensation. And by having chosen the spirit of Scripture, the logos of nature, and his intellect, and by uniting them indissolubly to each

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<sup>32</sup> *The Orthodox Study Bible*, Prepared under the auspices of the Academic Community of St. Athanasius Academy of Orthodox Theology, Elk Grove, California, USA, Thomas Nelson Publishers, 2008.

<sup>33</sup> Fr. Mazimos CONSTAS, Note 2, at Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 32..."; I.e., ὡς ἐν φορυτῷ τῷ ὕλη; cf. below, Qu. 59.1; Disp. Biz.: "With the letter alone blocking their minds like rubbish" (μόνον τῷ γράμματι ὡσπέρ τι φορυτῷ ἐγγώσαντες τὸν νοῦν) (ed. Allen and Neil, Documents from Exile, 92); Amb. 45.2: "[I am] like a blind man with outstretched hands, who, groping his way through the rubbish of the material world [φορυτὸν ὕλης], often stumbles upon something of value" (DOML 2:193); QThp.: τῷ φορυτῷ συμφορομένῳ (75, lines 31–32); and Clement of Alexandria, Protreptikos 10.92.4, citing Democritus, fr. 147 (SC 2:160).

<sup>34</sup> Fr. Mazimos CONSTAS, Note 3, at Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 32..."; Origen, Commentary on Romans 6.12.8, the Greek text of which is extant in the catena; cf. A. Ramsbotham, Documents: The Commentary of Origen on the Epistle to the Romans," JTS 14 (1913): 10–22 (= fr. 46, p. 18, line 16).

<sup>35</sup> Fr. Mazimos CONSTAS, Note 5, at Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 32..."; Cf. 2 Cor 3.6.

<sup>36</sup> Fr. Mazimos CONSTAS, Note 4, at Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 32..."; Cf. Mt 13.45–46.

other, he found God - in the sense that he came to know God, as much as this was necessary and possible - in the intellect, in the logos, and in the spirit."<sup>37</sup>

### **The duty to express the theological cosmology (ktisiology<sup>38</sup>) taking account of current scientific language**

The Holy Apostle Peter tells us that we have the duty to prepare ourselves adequately, in order to provide a rational (*logon*) apologetic (*apologian*) explanatory answer to those who ask us about our hope (*elpidos*) in the *Logos* incarnate, Jesus Christ. Of course, this rational response is elaborated theologically according to the Patristic methodology, but it must be expressed in a language accessible to the audience, including according to the scientific paradigm with which the audience is familiar, in order to make ourselves understood.

"Sanctify the Lord God in your hearts, and always be ready to give a defense [ἀπολογία] to everyone who asks you a reason [λόγον] for the hope [ἐλπίδος]<sup>39</sup> that is in you" (1Pt 3:15)<sup>40</sup>

In his PhD thesis, J. J. Johnson Leese concludes that the concepts of creation, new creation, protology, Adam, the image of God, eschatology, bodily resurrection, and the Church (as those who are now being re-created into the image of Christ) are central to Saint Apostle Paul's articulation of the Christ event and to his understanding of the recapitulation for renewal (Eph 1:10) that was inaugurated as a result of the Christ event.<sup>41</sup>

Fairly recent, being faithful to Tradition, St. Luke of Crimea affirms that "the Bible is in accordance with all natural realities, and therefore also with science, which discovers these

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<sup>37</sup> Saint Maximos the Confessor, "On Difficulties in Sacred Scripture: The Responses to Thalassios, Qu 32...", pp. 204-205; Sfântul Maxim Mărturisitorul, "Răspunsuri către Talasie, 32...", pp. 150-151.

<sup>38</sup> *Ktisiology*, derived from the Greek word "κτίσις" (*ktisis*), meaning "creation," and "λογία" (*logia*), meaning "study" or "discourse," refers to the theological study of creation. In Christian theology, *ktisiology* explores various aspects related to the doctrine of creation, addressing the nature, purpose, and significance of the created order as well as humanity's role within it.

<sup>39</sup> The ancient Greek term ἐλπίδος (*elpidos*), which is the genitive singular form of ἐλπίς (*elpis*), defines "hope" or "expectation". The term is used to express hope, expectation, trust, confidence.

<sup>40</sup> *The Orthodox Study Bible*, Prepared under the auspices of the Academic Community of St. Athanasius Academy of Orthodox Theology, Elk Grove, California, USA, Thomas Nelson Publishers, 2008.

<sup>41</sup> J. J. Johnson LEESE, *Christ, Creation, and the Cosmic Goal of Redemption: A Study of Pauline Ktisiology and its Interpretation by Irenaeus*, submitted for the Degree of Doctor of Philosophy at The University of Durham Department of Theology and Religion, 2014, p. 230; <http://etheses.dur.ac.uk/10850> (accessed at December 15<sup>th</sup> 2023)



facts,"<sup>42</sup> noting that "geology and paleontology have accurately confirmed the order of creation found in the Bible."<sup>43</sup>

Vladimir Lossky states that there can be no conflict between Orthodox theology and science because science does not have the means to start any conflict with theology or to bring to theology something new, through which to change the dogmas, which represent the boundaries of its practical spiritual experience. Although Lossky does not explicitly state it, he starts from the consideration that, since the object of science is the created world, it is difficult to suppose that it could contribute to the development of theology, as an practical experience of transcendental things. Lossky points out that:

"Christian theology [...] reconciles itself very well with any scientific theory about the universe, with condition that the latter does not go beyond its limits and does not try to deny [...] what is outside its field of study."<sup>44</sup>

Thus, having no philosophical or scientific preference<sup>45</sup>, the Church will always freely use philosophy and science for apologetic and cosmological purposes, but the Church will never dogmatize a particular scientific paradigm. That is why cosmologies will in no way affect the fundamental Truth discovered and experienced in the Eucharist, by the Church.

From the current Orthodox theological perspective, adequate scientific study (intellectually motivated by knowing the truth and the love for wisdom), has the potential to bring man closer to God, through the understanding of the laws of science of which *the Logos* is the maker:

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<sup>42</sup> Sfântul Luca al Crimeii, *Știința și religia*, Doxologia, trad. Denis Chiriac, Iași, 2018, pp. 62-63.

<sup>43</sup> Sfântul Luca al Crimeii, *Știința și religia...*, p. 70.

<sup>44</sup> Vladimir LOSSKY, *Teologia mistică a Bisericii de Răsărit*, Humanitas, București, 2010, p. 124.

<sup>45</sup> A *scientific paradigm* is a set of concepts, theories, methods and practices accepted and recognized by the scientific community in a specific field of research. It represents a general framework in which experimental data are interpreted and new hypotheses and theories are formulated. Paradigms provide a set of rules and standards against which scientific theories and models are evaluated and developed. Paradigms can include the following elements:

- a) *Fundamental theories and concepts* that explain the observed phenomena.
- b) *Experimental methods and tools* used to obtain and analyse the data.
- c) *Methodological principles and rules* for the validation and interpretation of experimental results.
- d) *Values, norms and beliefs* that influence the scientific process and the evaluation of theories.

A scientific paradigm can be influenced by several factors, such as experimental results, technological advances, changes in the philosophy of science, and social and cultural influences. As knowledge and technologies progress, paradigms may undergo shifts and alterations or be replaced by new paradigms that provide a more comprehensive understanding of natural phenomena.

"The openness of Orthodoxy to the world is maximum. Its embrace is comprehensive; nothing is left out! Any experience of knowledge in the field of sciences, in any field, can be a step towards getting closer to God. The embrace of Orthodoxy encompasses the whole world and all legitimate human endeavors. Our perseverance and the grace of God can transform the research laboratories into narthexes, in which our feeling and reason are prepared to perceive in the visible, the invisible, in the transient and the impassable, in Creation the traces of the Creator."<sup>46</sup>

In this regard Ștefan-Lucian Petcu notes:

"We can say that divine reasons are also the physical laws planted by God in the created universe, in view of its existence and proper functioning, the search for laws requiring a rational approach that is done for the glory of God."<sup>47</sup>

St. Luke, Archbishop of Crimea, a physician of genius, emphasizes a harmonious, complementary relationship between Orthodox theology and science, ruling out the possibility of any conflict:

"Many other arguments could be made, which would fully justify the assertion that true science and true religion, which is only the religion of the Bible, do not contradict each other. Religion is not against science [...]. Between revelation and nature, itself there is no contradiction, nor can there be, for God is the Creator of both. The common cause of preconceived ideas against religion lies, first of all, in ignorance."<sup>48</sup>

*St. Luke points out a common mistake, that of confusing science with the opinion of scientists<sup>49</sup>, as well as the fact that:*

"Many false things are also said about the relationship between religion and science. An attempt is made to create a conflict between the Gospel and human reason."<sup>50</sup>

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<sup>46</sup> Dan CHIȚOIU, Pr. Petre COMȘA, Sorin MIHALACHE, Costea MUNTEANU, "Raționalitatea creației", în Adrian LEMENI (coord.), *Repere patristice în dialogul dintre teologie și știință*, București, Basilica, 2009, p. 233-234.

<sup>47</sup> Pr. Lucian-Răzvan PETCU, *Cosmologia Creștină și teoriile fizicii moderne*, București, Sophia, 2008, p. 166,

<sup>48</sup> Sfântul Luca al Crimeii, *Știința și religia...*, pp. 71-72.

<sup>49</sup> Sfântul Luca al Crimeii, *Știința și religia...*, p. 51.

<sup>50</sup> Sfântul Luca al Crimeii, *Știința și religia...*, p. 120.

Archbishop Lazar Puhalo also considers that there can be no conflict between science and theology:

"All apparent conflicts between science and faith have their source in models of reality, and not in reality itself. The solution to this conflict could come from re-examining the models of reality that we have formed, which are based on outdated information. We should believe that the Church Fathers would have had the integrity and intelligence to renew their understanding of the history, geography, and nature of the Earth and the Universe, if they had had access to the technology and information that are readily available in our century. The Holy Fathers were open to knowing and exploring the world around them, and they themselves used the knowledge they had. We have every reason to believe that they would have used our own research and knowledge to alter many of their own models of reality. Altering our models of reality does not conflict with the basic dogmatic teachings concerning God (Creator, Progenitor and Savior)."<sup>51</sup>

Alexei Nesteruk notes that there is a fundamental difference between the status of the event of humanity of the Logos, understood as the beginning of ecclesial history on earth, and any other natural event that could lead to explainable consequences in its own future. An example from science would be that of the singular event called the Big Bang, as an initial event at the beginning of the universe's existence, which according to modern cosmology predetermined the necessary background for the unfolding of all consecutive events in the long history of the universe, including its current state. The reality of this initial cosmological event is based on the axiom of the existence of a correspondence between this initial event and its subsequent consequences, which we observe today, based on the scientific laws that explain the dynamics of the development of the universe.<sup>52</sup>

The distinction that existed in the past between the term *theologia* (referring to the direct knowledge of God through practical experience, in the liturgical framework), and the term *oikonomia* (referring to God's relationship with the created world) has disappeared today. The term theology has been replaced by knowledge of both God and His relationship to the world. Unfortunately, in modern debates on the relationship between science and theology, there is a

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<sup>51</sup> Lazăr PUHALO, *Dovada lucrurilor nevăzute. Ortodoxia și fizica modernă*, Theosis, Oradea, 2015, pp. 119-120.

<sup>52</sup> Alexei V. NESTERUK, *Lumina de la răsărit: teologie, știință și tradiție ortodoxă răsăriteană*, trad. Evagrina Dârțu și Irina Scurtu, București, Basilica, 2017, p. 114.

lack of the fundamental experimental component associated with the term *theology*, as participation in the Mysteries of the Church, corresponding to the patristic use of the word *theologia*. This lack is mainly caused by the fact that theology is considered almost exclusively in the modern Western understanding, meaning primarily economy, the teaching about the relationship between God and the world. In modern academic language, to this limited meaning of theology has been given various names, such as systematic theology or natural theology. This is the spectrum of theological discourses used in modern dialogue with science. As Alexei Nesteruk remarks, at present, no one is yet taking the risk of deeply analyzing the relationship between the contemporary scientific paradigm and mystical theology.<sup>53</sup>

Archbishop Lazar Puhalo emphasizes that:

"If we are not able, as preachers of the faith and as theologians, to approach in a pertinent and open way the problems caused by the new paradigms of the age in which we live, then we will remain stuck in outdated and meaningless models of reality, which we will always place in fierce conflict with the models of reality of physics and of all the sciences. If we fall prey to such arrogance, we will not be able to respond to all the spiritual needs and aspirations of humanity, we will not be able to spread the word of the Gospel and we will end up speaking only to the most superstitious and uncultured categories belonging to various social spheres. The younger generation will find itself betrayed by us, just as we betray the Gospel and the faith by manifesting a blind, reactionary religiosity, instead of opening ourselves to a new understanding and penetration into the inexhaustible richness of Orthodox revelation.<sup>54</sup>

### **Between Orthodox theology and science cannot be contradiction**

It should be noted that the founder of modern science, Galileo Galilei, stated that Holy Scripture contains revealed truth, including those about the functioning of the universe. The apparent inconsistency between scientific and theological explanations arises only when both scientists and theologians venture to make statements outside their field of competence.

"Our opinion is that the Scriptures agree entirely with the natural truths demonstrated. Rather some theologians unskilled in astronomy, they should be careful not to accuse the Scriptures of erring when they interpret them in contradiction with statements that may be true and

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<sup>53</sup> Alexei V. NESTERUK, *Lumina de la răsărit...*, p. 112.

<sup>54</sup> Lazăr PUHALO, *Dovada lucrurilor nevăzute. Ortodoxia și fizica modernă*, Theosis, Oradea, 2015, pp.136-137

demonstrated in [nature]. [...] There is not, or could be, an insurmountable difficulty in reconciling them with the truths demonstrated."<sup>55</sup>

This conclusion is also underlined by Fr. professor Ioan Ică:

"The real conflict is not between reason and faith, but only between a certain kind of science and a certain form of theology; therefore, this conflict exists not between science as such and Revelation itself, but between the ideological interpretative schemes in which they have been apologetically presented. The main responsible for this situation was the philosophy of Late Antiquity, whose axioms massively infiltrated medieval theology, but were also maintained in classical science. Ancient philosophical rationalism and determinism, which permeated scholastic theology and, from there, classical science, succeeded in dismantling both biblical Revelation and modern science, leading to a profound cosmological and anthropological division. This rationalism is to blame for the obsession with statism and fixity of species, for the refusal of evolution and time as constitutive dimensions of nature as a whole. Contemporary non-classical science is discovering precisely what Genesis and the Bible had already revealed (and Christians had forgotten under the pressure of the axioms of ancient philosophy): universal connectivity, the intimate connection in time and space of all individual beings and species of the material world, the essential unity between nature and man, between macrocosm and microcosm, between the beginning and the end of all creation. These connections have been forgotten in medieval Western theology, reconfigured."<sup>56</sup>

We would like to emphasize one of the fundamental messages of Orthodox Christian theology, namely that in order to relate to God it is necessary to know Him, which is achieved practically through participation in the liturgical life specific to the Church. Thus, it is easy to see that the perception of God can be expressed as an existential affirmation, based on experiencing Him directly; and not using rational proofs.

The Triune God revealed Himself, creating the world out of love, with love and for eternal love. The Logos became human and carried the message of the Father in the midst of creation. Thus, the paths of the natural sciences, which investigate the economic works of God in the created world, can constitute a way of living theologically.<sup>57</sup> In this regard Archbishop Lazar

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<sup>55</sup> Galileo GALILEI, *Lettere Copernicane = Scrisori Copernicane*, Trad. Smaranda Bratu, Elias Gheorghe Stratan, București, Humanitas, 2010, p.279

<sup>56</sup> Pr. Ioan ICA, "Dr. Kalomiros despre facerea lumii, iad și slava materiei și terapia discursului religios și pedagogic al Bisericii", în Pr. Ioan ICA, Dr. Alexandros KALOMIROS, Diac. Andrei KURAEV, Pr. Doru COSTACHE, *Sfinții Părinți despre originile și destinul cosmosului și omului*, Sibiu, Deisis, 2003, p. 9.

<sup>57</sup> Alexei V. NESTERUK, *Lumina de la răsărit...*, p. 110.

Puhalo pointed out that the only thing that Orthodox Christianity would ask from scientists is that they practice their profession with integrity and they refrain from trying to do theology.<sup>58</sup>

St. Luke of Crimea emphasizes that both science and theology have as their goal and finality the knowledge of God:

"Where does the widespread opinion among students and, in general, among educated people that science contradicts religion come from? The reason for this prejudice lies in a superficial knowledge of both the scientific and religious fields. This also confirms the idea: 'Knowledge leads to God, while partial knowledge distances us from Him.' Half -knowledge (superficial knowledge) is a scourge of our time: it is the one that generates the prejudice of which I have spoken."<sup>59</sup>

St. Luke of Crimea emphasized that only certain ideologized philosophical interpretations of the scientific paradigm can be in contradiction with theology

"The so-called 'scientific' atheism is, in reality, in contradiction with religion, but it is only an unproven and unprovable assumption of educated people."<sup>60</sup>

Archbishop Lazar Puhalo notes the need for

„[...] a more open, comprehensive, and theologically valid perspective on the physical and biological sciences, on human progress, and on the benefits of technology—all of which are gifts from God, who has endowed us with an intelligence capable of advancing in these areas."<sup>61</sup>

### **Complementarity of Orthodox theology and science in cosmology**

*The logos/ reason of being* of science is that it is methodologically and epistemologically rooted in philosophy and theology. Scientists can think about the universe because it is endowed with rationality, and humans have access to it through *dianoia* and *nous*. Scientific knowledge, by its nature, is cataphatic, given that all philosophical generalizations of science are constructed as statements.<sup>62</sup>

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<sup>58</sup> Lazăr PUHALO, *Dovada lucrurilor nevăzute...*, p. 15.

<sup>59</sup> Sfântul Luca al Crimeii, *Știința și religia...*, p. 49.

<sup>60</sup> Sfântul Luca al Crimeii, *Știința și religia...*, p. 51.

<sup>61</sup> Lazăr PUHALO, *Dovada lucrurilor nevăzute...*, p.16.

<sup>62</sup> Alexei V. NESTERUK, *Lumina de la răsărit...*, p. 149.

Scientific knowledge is based on the monism affirmed since the classical era of Greek philosophy. This philosophical vision considers that the universe is ontologically self-sufficient, self-sustaining, thus being possible an exhaustive epistemological explanation, without the need for the involvement of the transcendental, of any entity that could have any creative and maintaining role. The monist perspective has generated many philosophical currents. Naturalism, for example, considers that everything that happens is natural in the sense that it can be explained in ways that, although scientifically paradigmatic, are based exclusively on physical objects and events, denying the possibility of the existence of transcendental objects. Objective naturalism is purely methodological, and does not address ontological topics at all, considering that this is the sphere of philosophy and in any case, it is not relevant for the scientific approach. The followers of naturalism can have spiritual, religious, theological concerns, they can be idealists, materialists, theists or atheists. Out of them, materialists are those who have no concern for theology, since they deny the possibility of the existence of the transcendental, the world being reduced only to sensory perceived objects.

Immanuel Kant considers that any attempt to speak about God from the perspective of this world will involve the antinomy of reason, which cannot be resolved if one remains in the monistic sphere, which implies the reduction of God to a simple logical idea, devoid of ontological content.

*The inductive arguments for the existence of God from the observation of the created universe can be useful to theology only if it is continued with the direct, apophatic experience of Him.* In this way could be avoided the possibility of human thought falling into the trap of absolutization, through which cataphatic concepts are considered as replacements of transcendent realities experienced liturgically.

John Polkinghorne, an Anglican mathematician, physicist and priest, states:

"Reasoned faith, as surprising as it may be, should encourage theology to take a bottom-up approach and base its beliefs on real experience. [...] In both science and theology, the combination of experience and interpretation implies a degree of circularity, but this fact must not invalidate the rational commitment to well-reasoned and discerned faith."<sup>63</sup>

Polkinghorne's statements of theistic induction are identical to those of St. Maximus the Confessor, who states that in order to have a rational discourse about God, based on the created

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<sup>63</sup> John POLKINGHORNE, *Teologia în contextul științei*, Curtea Veche, București, 2010, pp. 16-17.

world, it is necessary to transcend the division between created and uncreated. For Polkinghorne, the transcendental leap from the cataphatic to the apophatic is accomplished simply by recognizing that the God expressed in words is known liturgically through direct experience. Thus, the monism of the created world is overcome, but not in a rational discursive way, but through mystical practical experience.

Science not only answers questions about how the universe works, but it is able to do so in a universally accepted way. However, *human consciousness plays a decisive role in scientific study because the facts studied are already interpreted by scientists*. Most of the time it is not possible to see directly what was happening, being necessary to deduce from what we observe, and deduction requires an interpretation. Then *the results of the experiments must be interpreted with the involvement of the human intellect*, as the Anglican scholar and theologian John Polkinghorne stated:

"To make interpretations, you have to already know some science. You can't just sit and watch; You have to choose a point of view. Choosing the point of view implies an act of intellectual daring, it involves betting that things are one way or another. This means that in science, experiment and theory, fact and interpretation are always merged. They are as inseparable as the meaning and ink that together make up [written] words."<sup>64</sup>

Alexei Nesteruk notes an important difficulty for both scientists and theologians:

"For scientists as well as for theologians it is a real challenge to be professionals in both fields, that is, to be rational with regard to the realities of these times and to be mystical with what is at the foundation of the visible world and which contains within itself the signs of the invisible and the uncreated. [...] It seems to be true at the same time that theologians must go beyond their own 'specialty' in order to acquire the language of science, and that scientists must become theologians in the complex sense of the word, that is, not only to generalize their theories to the level of philosophical limits, but also to acquire the way of contemplating the world that leads them to God [Holy Trinity persons] and that makes it possible to express what is contemplated through a new language. [...] The dialogue between theology and science requires a theological-scientific, intellectual (academic) and experiential (ecclesial) context that can be described in terms of the reciprocity of science and theology, without raising the

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<sup>64</sup> John POLKINHORNE, *Quarci, haos și creștinism*, București, Curetea Veche, 2006, p. 15.



question of the assimilation of one by the other."<sup>65</sup>

Science, through its various paradigms, explains us in more and more detail the way the physical world works. The road map is useful for those who travel, but no one thinks that highways are thin blue lines, and cities are black dots. If a map did not represent at least part of the truth of reality, it would not work at all. The same is true of scientific paradigms, which draw up maps of the physical world that can satisfy certain needs, but not all.

It is known that religion involves faith. Unfortunately, however, faith sometimes has pejorative connotations in contemporary culture, being associated by the ignorant with the unconditional acceptance of certain dogmatic formulations. In contemporary language, *trust or confidence* are the most appropriate words to express the religious reality of Orthodox Christianity. Trust is an action that has a specific purpose: knowledge. Thus, trusting in God implies knowing Him both personally and in the communion of the Church. We note that *both science and theology are based on concrete empirical observations*, of course the first in the physical field, and the second in the metaphysical field, they complement each other in the knowledge of the physical and spiritual Truth. John Polkinghorne states:

"In essence, science and religion are intellectually related. Both seek motivated faith. None of them can support an absolute certain knowledge, because everyone must base their conclusions on an interpenetration between interpretation and experience. [...] Both are part of the huge human effort to understand."<sup>66</sup>

Science alone gives us only a limited view of reality. It is incapable of talking about aesthetics, art, etc. The human conscience does not appreciate the beauty of a painting after scientific analysis of the composition of paints or canvas; nor do they appreciate the beauty of music according to the scientific analysis of sound waves. Also, ethical values and feelings cannot be scientifically analyzed. Normally love is sought, desired and appreciated, and hatred is avoided.

Alexei Nesteruk emphasizes that:

"If we accept that both theology and science show two modes of spiritual activity of the human being, it is difficult to accept that these two modes lead to contradictory perspectives on the

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<sup>65</sup> Alexei V. NESTERUK, *Lumina de la răsărit...*, pp. 30-32.

<sup>66</sup> Alexei V. NESTERUK, *Lumina de la răsărit...*, p. 22.

nature and meaning of humanity and the universe as God's creations. Therefore, a careful investigation of the meaning of science within a broader theological context (one based on an open epistemology) would be of great use. [...] The thesis that no scientific synthesis can affect theology, can really be interpreted in a positive sense – namely, that nothing in science (as a mere component of a much larger experience) can come against the whole of this experience which is theological by definition."<sup>67</sup>

All sciences have a common principle (*logos*, the basic principle of their functioning, structure, object of interest). This principle can be formulated in such a way that all variants of scientific discourse have a similar relationship to theology.

Nesteruk concludes that science, as a participant in the dialogue with theology, cannot enter into this dialogue in a 'purely scientific'<sup>68</sup> manner. The science will be interpreted inevitably in a broader cultural, linguistic and social context, in a way that places the global perception of science in the metaphysical perspective of philosophy and theology. As such, philosophy plays the role of linguistic and conceptual mediator between the rational structures of science and the open apophatic theology. Therefore, the mediation between science and theology can only be attempted from within theology and, it can be carried out as a way of practical theological experience.

Such a mediation can make use of any existing philosophy by its ability to mediate between dualism and monism, and by the fact that it is not an *a priori* set of logical rules, but an open epistemology that follows the path of open apophatic theology.

"It follows, therefore, that the dialogue between science and theology is not possible from a non-theological perspective, because reflecting on theology (if it is understood in the patristic sense) is, in itself, an activity of theologizing – and is therefore theology."<sup>69</sup>

The field of theology, as an intellectual expression of faith in God, is broader than the field of science, which explores a sub-field that corresponds to the created world. Therefore, the mediation between science and theology is in fact an inseparable part of the undivided experience of the human person as a communion with God. Our goal is to make the experience of mediation between science and theology clearly formulated into categories of thought,

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<sup>67</sup> Alexei V. NESTERUK, *Lumina de la răsărit...*, p. 134.

<sup>68</sup> Alexei V. NESTERUK, *Lumina de la răsărit...*, p. 140.

<sup>69</sup> Alexei V. NESTERUK, *Lumina de la răsărit...*, pp. 121-122.

emphasizing that apophatic Orthodox theology gives us the freedom to use any philosophical ideas and schemes for the purpose of constructing the methodology of this description.

Francis Collins<sup>70</sup>, director of the Human Genome Project, says:

"Science is the only reliable way to understand the physical world, and its means, when used correctly, can penetrate into the depths of material existence. But science becomes powerless when it has to answer questions such as: 'Why did the universe come into being? What is the meaning of man's existence? What happens after death?'"<sup>71</sup>

Professor Owen Gingerich<sup>72</sup>, affirmed the complementarity between science and theology:

"Just as I believe that through the Book of Scripture the path of God is illuminated, I also believe that through the Book of Nature, with all its amazing details – the blade of grass, the absence of [atomic] mass five<sup>73</sup> or the incredible complexity of DNA – a God of purpose and a God of design is suggested. And I think that faith doesn't make me any less of a scientist."<sup>74</sup>

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<sup>70</sup> *Francis Sellers Collins* (born April 14, 1950) is an American physician-scientist who discovered the genes associated with a number of diseases and led the Human Genome Project. He served as director of the National Institutes of Health (NIH) in Bethesda, Maryland, from 17 August 2009 to 19 December 2021. Before being appointed director of the NIH, Collins led the Human Genome Project and other genomics research initiatives as director of the National Human Genome Research Institute (NHGRI), one of the 27 institutes and centers at NIH. Before joining NHGRI, he earned a reputation as a gene hunter at the University of Michigan. He has been elected to the Institute of Medicine and the National Academy of Sciences, and has received the Presidential Medal of Freedom and the National Medal of Science. Collins also has written books on science, medicine, and religion, including the New York Times bestseller, *The Language of God: A Scientist Presents Evidence for Belief*. After leaving the directorship of NHGRI and before becoming director of the NIH, he founded and served as president of The BioLogos Foundation, which promotes discourse on the relationship between science and religion and advocates the perspective that belief in Christianity can be reconciled with acceptance of evolution and science, especially through the idea that the Creator brought about his plan through the processes of evolution. In 2009, Pope Benedict XVI appointed Collins to the Pontifical Academy of Sciences.

<sup>71</sup> Francis COLLINS, *Limbajul lui Dumnezeu: Un om de știință aduce dovezi în sprinjal credinței*, trad. Silvia Palade, București, Curtea Veche, 2009, p. 12.

<sup>72</sup> *Owen Jay Gingerich* (March 24, 1930 – May 28, 2023) was an American astronomer who had been professor emeritus of astronomy and of the history of science at Harvard University and a senior astronomer emeritus at the Smithsonian Astrophysical Observatory. In addition to his research and teaching, he had written many books on the history of astronomy. Gingerich was also a member of the American Academy of Arts and Sciences, the American Philosophical Society, and the International Academy of the History of Science. A committed Christian, he had been active in the American Scientific Affiliation, a society of evangelical scientists.

<sup>73</sup> The "*mass-5 roadblock*" refers to a significant limitation in the process of nucleosynthesis during the early universe, particularly during the era known as Big Bang nucleosynthesis (BBN). This is a critical factor in understanding the formation of elements in the early universe. Due to the absence of stable nuclei with a mass number of 5, the nucleosynthesis process during the Big Bang was limited to the production of the lightest elements. The creation of heavier elements had to wait for the complex processes occurring in stars, thereby shaping the elemental composition of the universe as we observe it today, thus implying the *fine-tuned universe* and *anthropic principle*.

<sup>74</sup> Owen GINGERICH, *Universul lui Dumnezeu*, Trad. Viorel Zaicu, București, Curtea Veche, 2010, p. 99.

St. Luke of Crimea emphasizes that science has the role of leading man thirsting for truth, from what is created to the Creator:

"If we analyze religion in its essence, we must say that it is an inner experience, as worship before God and communication with Him. We should agree that science not only does not contradict religion, but even more than that, science leads to religion. [...] Science is the one that demonstrates its necessity. It asks the questions that religion answers. According to the law of cause and effect, science brings us to the First Cause of the world, and religion answers us Who is this Primary Cause, Creator not only of the world, but also of man. [...] Science reveals us the eternal Logos of existence, which conditions this harmony. Science brings us to the need for a rational meaning in life. [...] Religion answers us that GOD is that [rational meaning]."<sup>75</sup>

John F. Haught's book entitled "Science and Religion: From Conflict to Dialogue"<sup>76</sup> offers a reasoned and balanced perspective on the complex relationship between science and religion, promoting dialogue and mutual understanding between the two fields. Haught addresses the complex relationship between science and religion, and tries to overcome the perception of conflict between the two fields, promoting a constructive dialogue. Haught explores the complementarity between science and theology, highlighting that the two disciplines address different aspects of reality and that they complement each other in the deep understanding of the world in which we live. He argues that science and religion can have a fruitful dialogue, providing complementary perspectives on the world and human existence. Haught discusses the limited aspects of science, emphasizing that science has its own methods and limits in terms of understanding reality, and religion offers essential dimensions and questions that science cannot address. He argues that religion brings meaning, value and ethics to human life, aspects that cannot be reduced to scientific explanations.

Francis Collins, affirms the synergic complementarity between theology and science, stating:

"In my opinion, there is no conflict between being a rigorous scientist and a person who believes in a God who has a personal connection to each of us. The field of science is the research of nature. God's realm was in the realm of the spiritual, a territory impossible to explore with the means and language of science. It must be searched with heart, mind and soul

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<sup>75</sup> Sfântul Luca al Crimeii, *Știința și religia...*, pp.72-73

<sup>76</sup> John F. HAUGHT, *Știință și religie. De la conflict la dialog*, XXI: Eonul Dogmatic, București, 2002.

– and the mind must find a way to embrace both territories.”<sup>77</sup>

His Eminence Nicholas, Metropolitan of Mesogaia and Lavreotiki, is director of the "Center for Biomedical Ethics and Deontology" in Athens and president of the Bioethics Commission of the Synod of the Greek Orthodox Church. At the meeting of the Synod of the Church of Greece on 4 October 2012, he stated that the opinion of Francis Collins, head of the Human Genome Project (HGP) human gene research program, about the relation between science and theology is remarkable. In his book entitled 'The Language of God', Collins argues that God is not a subject for science, but for scientists, and that all atheistic statements are not evidence of scientific research, but the findings of scientific brains, guided by an arbitrary judgment. As such, Collin's book represents a unique, personal journey on the path of faith of one of the greatest scientists of the genetics domain. However, it is sad to notice that this book remains largely unknown and has great difficulty in being properly promoted. Despite the fact that the science domain of genetics has been largely misinterpreted ideologically, as having an implicit scientific demonstration of God's inexistence, one of the most important genetics scientists confesses his belief in God. The rigorous scientific research and astonishing results in genetics, helped Collins to become Christian.<sup>78</sup>

Denis Alexander<sup>79</sup>, Director of the *Faraday Institute for Science and Religion*, Fellow of St. Edmund College at the University of Cambridge, states that

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<sup>77</sup> Francis COLLINS, *Limbajul lui Dumnezeu...*, p. 12.

<sup>78</sup> "Biserica față în față cu noile concepte și tehnologii – ÎPS Nicolae, Mitropolit de Mesogaías și Lavreotikís", Logos. Portalul Tineretului Ortodox din Republica Moldova, <http://logos.md/2013/02/18/biserica-fata-in-fata-cu-noile-concepte-si-tehnologii-ips-nicolae-mitropolit-de-mesogaias-si-lavreotikis/> (accesat la data de 12 mai 2017)

<sup>79</sup> Dr. Denis Alexander has spent 40 years in the biomedical research community. He is an Emeritus Fellow of St. Edmund's College, Cambridge and an Emeritus Director of the Faraday Institute for Science and Religion, Cambridge which he co-founded with Bob White in 2006. Alexander has written on the subject of science and religion since at least 1972, when his book 'Beyond Science', written at the age of 25/26, was reviewed by Hugh Montefiore, then Bishop of Kingston upon Thames in the New Scientist. In the late 1980s he became a member of the National Committee of Christians in Science [www.cis.org.uk] and served on the Committee until 2013. In 1992 he became editor of the journal Science and Christian Belief, a post he held until 2013. Alexander served on the Executive Committee of the International Society for Science and Religion and is a member of the Cambridge Papers Writing Group for which he writes papers related to science and religion. In January 2006 Alexander became the founding Director of the Faraday Institute for Science and Religion which was originally founded as part of St Edmund's College, Cambridge. The Institute carries out research on science and religion, runs courses, and engages in academic dissemination on the topic through seminars, lectures, panel discussions and in schools. In October 2012 Alexander became Emeritus Director and is now Chair of the Board of Trustees of the Institute. In December 2012 Alexander gave the Gifford Lectures at St Andrews University on the theme "Genes, Determinism and God". Alexander writes and lectures widely on science and religion. His book *Rebuilding the Matrix – Science and Faith in the 21st Century* was published in 2002. Alexander is well-known for his critique of creationism and of "intelligent design". Alexander engages in the public understanding of science and religion. This includes articles published on web-sites such as Nature, The Guardian and The Huffington Post. TV programmes such as David Malone's Testing God documentary for Channel 4, Rod Liddle's Channel 4 programme The Trouble with Atheism and a series of interviews for the US "Closer to Truth" TV series, together with

"The fact that we take evolution as a biological theory should not affect our Christian belief in the uniqueness of humanity's role in the image and likeness of God. [...] Christians who have made it their mission to attack evolution, mistakenly assuming that it is against God, are embarrassing and bring a bad name to the gospel. [...] Attacking the theory of evolution brings division and divides the Christian community, erecting superfluous barriers to those who want to know more about the heart of the teachings of the Christian faith. From my experience in the scientific community, I know that today the word Christian is often equated with the idea of creationism (literally) or the Intelligent [Design] Project, making it even more difficult to spread the good news about Christ."<sup>80</sup>

Former Roman Catholic priest and professor of molecular biology at Irvine University in California, Francisco Ayala<sup>81</sup>, states:

"There should be no antagonism between evolution and religious convictions. Believers could see the presence of God in the actions of nature and in the creative powers of natural selection, first observed by Darwin."<sup>82</sup>

On the contingent nature of the laws of science, professor John Hands<sup>83</sup>, who studied chemistry at the University of London, states:

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numerous radio discussions and interviews, such as his interview with Joan Bakewell in her BBC series "Belief", on Australian national radio, and radio debates with Stephen Law and P.Z. Myers. In 2018 Alexander spoke in favour of the motion "This House Believes that Science Alone Can Never Answer our Biggest Questions" at an Oxford Union debate.

<sup>80</sup> Denis ALEXANDER, *Creation or Evolution: Do we have to choose?* Trans. by Viorel Zaicu Ramona Neacşa-Lupu, Bucharest, *Curtea Veche*, 2010, pp. 399-401.

<sup>81</sup> *Dr. Francisco José Ayala Pereda* (March 12, 1934 – March 3, 2023) was a Spanish-American evolutionary biologist and philosopher who was a longtime faculty member at the University of California, Irvine, and University of California, Davis. Ayala was previously president and chairman of the board of the American Association for the Advancement of Science. At University of California, Irvine, his academic appointments included University Professor and Donald Bren Professor of Biological Sciences, Ecology & Evolutionary Biology (School of Biological Sciences), Professor of Philosophy (School of Humanities), and Professor of Logic and the Philosophy of Science (School of Social Sciences). Earlier in life, Ayala was a Dominican priest, ordained in 1960 and leaving the priesthood that same year. After graduating from the University of Salamanca, he moved to the United States in 1961 to study for a PhD at Columbia University. There, he studied for his doctorate under Theodosius Dobzhansky, graduating in 1964. He was a critic of intelligent design theories, claiming that they are not only pseudoscience, but also misunderstood from a theological point of view. He suggested that the theory of evolution resolves the problem of evil, thus being a kind of theodicy. In 2001, Ayala was awarded the National Medal of Science. On April 13, 2007, he was awarded the first of 100 bicentennial medals at Mount Saint Mary's University for lecturing there as the first presenter for the Bicentennial Distinguished Lecture Series. His lecture was entitled "The Biological Foundations of Morality". Ayala delivered a lecture at the Trotter Prize ceremony in 2011 entitled "Darwin's Gift to Science and Religion."

<sup>82</sup> Francisco J. AYALA, *Darwin's Gift to Science and Religion*. Trad. Doina Rogoti, Bucharest, *Curtea Veche*, 2009, p. 248.

<sup>83</sup> *John Hands* is a British author, trained as a scientist. Hands won an Arts Council England award to research and write *Cosmosapiens: Human Evolution from the Origin of the Universe*, published in the UK by Duckworth Overlook in 2015 and in the USA in 2016. John Hands' "Cosmosapiens" is a monumental work that challenges

"Science, an empirical discipline, cannot explain what caused the existence of these physical and chemical laws, why these parameters have their respective critical values, and why there was on planet Earth a concurrence of extremely improbable and unusual factors, which, combined, produced the necessary conditions for our evolution. (Multiverse conjectures are just untestable speculations, and most are based on questionable logic.) And without this knowledge, the causal chain that led to the emergence and evolution of humans is incomplete."<sup>84</sup>

Saint Luke of Crimea, emphasize that science cannot be used as a rational justification for inexistence of God

"In general, we don't see things as they are, but we perceive them according to our own point of view from which we analyze them. If we cannot understand by use of scientific means of knowledge what lies behind things, i.e., their essence, even more we cannot know the Primary Essence, God. This is the reason why science cannot deny the existence of God, because this domain is outside its competence, as well as the entire domain of the essence of things."<sup>85</sup>

His Eminence Ioannis Zizioulas noted that for a long time, science and theology seemed to be looking for different types of Truth in their specific endeavors, as if Truth were not one in the exhaustiveness of existence. This was the result of the dichotomous analysis of Truth, between the transcendent and the immanent and, in the final analysis, of the fact that both the theological notion of truth and the scientific notion of it were deprived of the attribute of communion, being considered only in terms of the subject-object structure, as an analytical method of research.

"Einstein's revolution in science, however, meant a radical reorientation of the scientific search for Truth. Its ultimate consequences have not yet been perceived, but one thing seems clear: the Greek conception of being was decisively affected by the notion of relationship; for the natural sciences after Einstein, being became relational. This brings scientific truth to where

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readers to rethink their understanding of the universe and human evolution. By synthesizing scientific knowledge with philosophical inquiry, Hands provides a nuanced perspective that acknowledges the complexity and mystery of our existence. The book calls for a humble and open-minded approach to scientific inquiry, recognizing the limitations of our current understanding while celebrating the progress made. In essence, "Cosmosapiens" is a testament to the human quest for knowledge and meaning, offering a hopeful vision of continued discovery and intellectual growth. It underscores the importance of curiosity, critical thinking, and ethical consideration in our ongoing exploration of the cosmos and ourselves.

<sup>84</sup> John HANDS, *Cosmosapiens: Evoluția omului de la originile Universului*, Trad. de Carmen Strungaru și Doru Căstăian, București, Humanitas, 2019, pp. 671.

<sup>85</sup> Sfântul Luca al Crimeii, *Știința și religia...*, pp. 50-51.

the Greek Fathers arrived at the philosophical level and gives us the opportunity to speak of a unique Truth in the world, which we approach scientifically or theologically."<sup>86</sup>

His Eminence Ioannis Zizioulas notes that if theology creatively uses the Greek patristic synthesis on Truth and communion and applies it in the Church, then the apparent dichotomy between theology and science will disappear. The scientist is at the same time a member of the Church, a man capable of realizing that he is fulfilling a Eucharistic call, which can lead to the liberation of nature from the slavery imposed by modern man, who is increasingly dependent on technology. The Eucharistic conception of the Truth is destined, on the one hand, to free man from the passion of the greed to dominate creation by enslaving it; and on the other hand, to make man aware that Christ-the Logos-Truth became human for the whole creation. The deification that Christ brings as a communion of divine life (cf. 2 Pt 1:4) relates to the whole of creation, not just to the human being.<sup>87</sup>

Alexei Nesteruk notes that the notion of truth in a theological context makes the experimental dimension of theology fundamental, because since St. Ignatius of Antioch and St. Irenaeus of Lyons, truth was inextricably linked to true life understood in a practical liturgical sense, centered on the Eucharist. This renewing perspective has made the Eucharist the principle of human existence, understood as true life. Thus, Holy Communion became the fundamental, defining principle of truth, and implicitly a principle of immortality. Being subject, in our daily life, to corruption and death, life in the Church, understood as the acquisition of the ecclesial hypostasis in our own nature (that is, of incorruption and immortality), is possible only through the Eucharist, because Christ gives us life, keeps us alive and gives us a foretaste of eternity<sup>88</sup>, through participation in His victory over death.

In Orthodox Theology, Jesus Christ is the Alpha and Omega, the beginning and the end of all things, He is the Creator and purpose of creation, the One through whom and for whom the universe exists (Colossians 1) and has reason, unity, meaning and purpose.

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<sup>86</sup> IPS Ioannis ZIZIOULAS, *Ființa eclezială*, Bizantină, București, 2007, pp. 123-124.

<sup>87</sup> IPS Ioannis ZIZIOULAS, *Ființa eclezială...*, p. 124.

<sup>88</sup> Alexei V. NESTERUK, *Lumina de la răsărit...*, p. 87.



### **Christocentrism. The Big Bang Contingency.**

The Big Bang theory, which describes the origin of the universe (space, time, matter, energy) from "nothing", provides a context in which we can reflect on the beginning of the universe's existence. In a remarkable way, this scientific theory is consistent with the Christian theological view that the universe has a beginning, being created out of nothing by God, which can be rationally understood as a creative act of *the Logos*.

Another relevant concept is that of *fine-tuning* of the fundamental constants of the universe. Many scientists observe that the physical parameters of the universe are adjusted with a precision that tends to infinity to allow for the existence of human life that has consciousness. This *fine-tuning* can be rationally understood as evidence of the existence of a plan and purpose for the universe, resonating with the *Christocentric vision* of creation affirmed by Orthodox theology.

Quantum mechanics reveals a deep level of interconnectedness between all particles in the universe, known as quantum entanglement. This phenomenon shows that particles can remain related and influenced each other regardless of the distance between them, in a way that is mysterious to science, which denotes an amazing unity of the universe. Thus, quantum entanglement can be expressed theologically as a manifestation of the unity and rationality of creation in the *Logos*, the One who binds all things together in a rational way and keeps them in existence.

The universe is presented as a unitary, rational reality, as evidenced by the order and harmony of the constituent elements, elegantly<sup>89</sup> described by the laws of various scientific paradigms. For Orthodox Christian theology, every existing thing has its own reason in *God's Reason*, or the *Logos* of God<sup>90</sup>. The existence of everything has its origin in God's will for that thing to be.

The meaning and purpose of creation is Jesus Christ. Thus, according to Orthodox theology, creation is *Christocentric*. The rational foundation of created things has a twofold purpose, a physical one, *namely* to be useful to man for the maintenance of life; and a spiritual one, *that* of increasing the knowledge of the spiritual meanings that culminate in their source, which is God, the only one who offers existential fulfillment to man<sup>91</sup>.

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<sup>89</sup> Brian GREENE, *The Elegant Universe*, New York, Random House, 2000.

<sup>90</sup> Pr. Prof. Dumitru STĂNILOAE, *Teologia Dogmatică Ortodoxă*, vol. I, București, Ed. Institutului Biblic și de Misiune a Bisericii Ortodoxe Române, 2003, p. 360

<sup>91</sup> Pr. Prof. Dumitru STĂNILOAE, *Teologia Dogmatică Ortodoxă*, vol. I..., pp. 360-374.

The Orthodox Christian doctrine regarding the rationality of the world is based on the *Logos*. *Rați*o is the Latin equivalent of the Greek term *logos*. The Patristic Orthodox Theology on the *Logos* begins with the prologue of the Fourth Gospel, that of the Holy Apostle John, and with authors such as St. Justin the Martyr and the Philosopher, culminating in the elaborate doctrine on the *logoi* of St. Maximus the Confessor, involving Revelation, creation, cosmology, and theological anthropology. Also, this topic requires at least elementary knowledge of classical Greek philosophy, starting with the Pre-Socratics and up to late Hellenism<sup>92</sup>. The Philonian paradigm for *logos*, which integrated philosophical meanings with Jewish theological meanings, played an important role for Christianity.

*Logos* in Greek has the meaning of word, reason or plan, having the plural *logoi*. In ancient Greek philosophy, the term *logos* has the meaning of divine reason implicit in the cosmos, which gives the latter order, form, and existential purpose.

The Holy Fathers gave great importance to the subject of the rationality of the world. Following this theological foundation, Father Nicolae Moșoiu underlined the importance of this subject in contemporary times<sup>93</sup>, offering an extensive analysis, considering that it provides theology with a sure premise of honest dialogue with the exact sciences<sup>94</sup>.

According to Professor Nicolae Chițescu, *Paradigms* are the eternal divine models while the *logoi* or *Seminal reasons* are the natural laws, or the productive and rational causes in the universe; the essential difference between *Paradigms* and *logoi* is that they belong to the temporal plane and the empirical world, while the paradigms "synthetically pre-exist in God, as primordial elements of all reality"<sup>95</sup>; and the uncreated divine energies are the reasons in the creative and sustaining action of God with regard to all creation.

Father Adrian Sorin Mihalache notes the rationality and unity of the physical world, elegantly expressed in the current scientific context<sup>96</sup>.

The impossibility of separating time from processes has been elaborated since antiquity, from the Hellenistic period, by Philo of Alexandria in biblical exegesis through synthesis with

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<sup>92</sup> Dan CHIȚOIU, Pr. Petre COMȘA, Sorin MIHALACHE, Costea MUNTEANU, "Raționalitatea creației", în Adrian LEMENI (coord.), *Repere patristice în dialogul dintre teologie și știință*, București, Basilica, 2009, p. 129.

<sup>93</sup> Nicolae MOȘOIU, *Taina prezenței lui Dumnezeu în viața umană. Viziunea creatoare a Părintelui Profesor Dumitru Stăniloae*, Paralela 45, Pitești, 2002, pp. 33-45.

<sup>94</sup> Pr. Conf. Nicolae MOȘOIU, *Hermeneutica Ortodoxă ca dezvoltare teologică în Tradiție*, Astra Museum, Sibiu, 2013, pp. 122-160.

<sup>95</sup> Prof. Nicolae CHIȚESCU, "Paradigmele divine și problemele pe care le ridică ele pentru Teologia Dogmatică", în *Ortodoxia*, an. X, 1958, nr. 1., p. 45.

<sup>96</sup> Diac. Adrian Sorin MIHALACHE, *Lumina Celui Nevăzut: O privire teologică în raționalitatea creației și teoriile științifice recente despre Univers. Vol. I*, București, Basilica, 2016, pp. 284-287.

Hellenic philosophy. Thus, Philo asserts that time cannot be separated from what is observed as change in time. In this way, time reveals the immanent reality of the world. In contrast to this view, most ancient Greek philosophers believed that the world was the work of divine creation in pre-existing space and time. Christianity developed the concept of creation out of nothing – *creatio ex nihilo*. Thus, the universe is created with space and time, and not in pre-existing space and time. Father Dumitru Stăniloae states that:

"This world cannot be forever. For there cannot be forever a world in the temporal aspiration towards a goal - as it is evident - without having reached this goal of perfection until now, which satisfies it. It [...] must once again end its form of temporal, or changing, existence"<sup>97</sup>

At present, science confirms the Christian theological vision of the creation of the universe from nothing, with space and time, in a dynamic development rationally grounded, according to a plan, towards a goal that encompasses rational human life. Thus, the scientist Stephen Hawking states about the beginning of the universe "I believe that the universe arose spontaneously out of nothing according to the laws of science."<sup>98</sup> Thus, he implicitly considers the contingent character of the laws of science, as they belong to the metaphysical sphere. Also, Steven Weinberg, Nobel Prize laureate in physics, noting the compatibility of the Big Bang theory with the Christian theological vision of the seen creation, states:

"Certain cosmologists are philosophically attracted to the oscillating model, especially because, like the steady-state model, it elegantly avoids the problem of *GENESIS*. Such a model does, however, face a severe theoretical difficulty. With each cycle, the ratio of the number of photons to the number of particles (or more precisely, the entropy per number of particles) increases slightly, due to a kind of friction (known as global friction) that occurs as the universe expands and contracts. As we deduce, the universe starts in each new cycle with a new ratio of photons to particles, somewhat higher than the previous ratio. The current ratio is large, but not infinite, so it's hard to see how the universe could have gone through an infinite number of cycles."<sup>99</sup>

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<sup>97</sup> Pr. Prof. Dr. Dumitru STĂNILOAE, *Chipul nemuritor al lui Dumnezeu*, Ed. Mitropoliei Olteniei, Craiova, 1987, p. 249.

<sup>98</sup> Stephen HAWKING, *Răspunsuri scurte la marile întrebări*, Editura Humanitas, 2021, p. 44.

<sup>99</sup> Steven WEINBERG, *Primele trei minute ale Universului - Un punct de vedere modern asupra originii Universului*, Ed. Politică, București, 1984, pp. 167-168

The scientist Max Plank scientifically affirms the existence of the rational foundation of creation, the contingent character of the laws of science, and the existence of multilayered physical and metaphysical reality:

"Metaphysical reality is not to be understood spatially, as being situated behind the natural world. Metaphysical reality is not located behind empirical experience, which is located in its very depths, structuring and determining it. All we want to say is that the sensible world is not the only one that exists, but there is also another reality, superior, inaccessible to empirical experiment, but which science intuits and recognizes. Scientific knowledge makes the scientist research and discover these deep structures of existence."<sup>100</sup>

The rationality of the cosmos, inherent to the scientific observations presented paradigmatically in scientific theories, having a contingent character, can only be explained by the involvement of the metaphysical domain, the mathematical language being used by human rationality. Thus, the scientist Roger Penrose notes that the universe presents a multilayered reality, in which the physical and the metaphysical are intertwined.

"The very reality of the physical world seems more nebulous than it had appeared before the advent of SUPERB theories of relativity and quantum mechanics [...] The very accuracy of these theories has given physical reality an almost abstract mathematical existence [...] Is this a paradox? How can concrete reality become abstract and mathematical? [...] Perhaps, in some sense, the two worlds are practically *one and the same*?"<sup>101</sup>

In this context, from the Orthodox theological point of view it is found that the current scientific theories

"Suggests that there is something that might be called levels of reality that separate Reality. In other words, the current scientific theories, which describe our image of the Universe, do not exactly place one in the extension of the other, but on the contrary they are discontinuous."<sup>102</sup>

Discussions about the cause of the way the universe works are not part of the scientific field because the hypotheses cannot be empirically verified with the help of the current

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<sup>100</sup> Max Plank, *L'image du monde dans la physique moderne*, Zurich, Gonthier, 1949, p. 174.

<sup>101</sup> Roger PENROSE, *Mintea noastră... cea de toate zilele*, trad. Mircea Rusu și Cornelia Rusu, Tehnică, București, 2006, p. 775.

<sup>102</sup> Dan CHIȚOIU, Pr. Petre COMȘA, Sorin MIHALACHE, Costea MUNTEANU, "Raționalitatea creației...", p. 219.

scientific method. Thus, these discussions belong to the metaphysical field that preoccupies theologians and philosophers.

At the initial singularity from which the Big Bang emerged, space and all matter were infinitely compressed into an infinitely small volume, which in our common language defines nothingness, and time and space did not exist. Thus, there was no space-time in which the Big Bang explosion took place, but space and time itself have a beginning of existence at the Big Bang, along with matter, out of nothing<sup>103</sup>. We can make an analogy with a balloon. Only its surface represents the space, and the material of the balloon is evenly distributed on this surface. At the time of the Big Bang, an external cause of the universe made the beginning and expansion of space, the beginning and flow of time, the emergence and scattering of matter in this dynamic space-time, but not in any way but in a rational, planned way, which can be described by scientific laws, having a meaning and a purpose that involves rational human life that has consciousness.

In the beginning, each point in space represented a possibly different way from which the Universe could have started. Thus, the Creator, in order to make a low-entropy universe in which it would be possible for rational human life to emerge, had to choose exactly a certain point in the phase space<sup>104</sup>. Each point in phase space corresponds to a certain type of possible universe. Scientist Roger Penrose states in reference to *the fine-tuning* of the universe:

"How large was the initial volume of phase space that the Creator had to aim for in order to produce a universe compatible with the second law of thermodynamics and the one we are now observing? [...] This value shows us how precisely the Creator had to aim, namely with an accuracy of part of  $10^{10^{123}}$ . This is an extraordinarily high value. We can't even write this number in its entirety, in base 10 it would be «1» followed by  $10^{123}$  successive zeros! Even if we wanted to write '0' on every proton and neutron in the entire universe – in fact, we could take all the other particles in a row – we won't be able to write the whole number because of

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<sup>103</sup> Diac, Adrian Sorin MIHALACHE, *Lumina Celui Nevăzut: O privire teologică în raționalitatea creației și teoriile științifice recente despre Univers. Vol. II*, București, Basilica, 2016, pp. 122-128.

<sup>104</sup> *Phase space* is a method of mathematical representation of space. *The phase space method* was introduced by Henry Poincaré for the study of dynamical systems with one or more degrees of freedom. In principle, it is associated with the movement of the system considered a point that moves simultaneously with the system in a space related to a coordinate system, made up of the variables (parameters) that determine the momentary position of the system and the derivatives of these variables, called *phase space*. The advantage of this method of representing space is that it presents a clear picture of all the possibilities of movement that arise in a dynamic system.

the lack of particles."<sup>105</sup>

The rationality of creation from the perspective of current cosmology is based on the nature of the observed interactions between the particles of matter of the universe, which according to human intellectual knowledge implies an order, which denotes the existence of a plan. The foundation of these correlations involves the present value of entropy in the universe, entropy being the one that measures the state of order and disorder of the universe, its value being directly proportional to the disorder. At the time of the Big Bang, entropy (S) was almost entirely due to radiation, with an estimated value of  $10^{88}k$ , where  $k$  is the Boltzmann constant. The thermodynamic understanding of entropy is based on the second law of thermodynamics<sup>106</sup>, which explains why the universe is in a continuous dynamic state in the direction of increasing entropy. The specific entropy (s) has an estimated value of  $10^{88}$  and represents the number of photons per baryon, being a fundamental parameter for the existence of stable physical systems. Even the slightest variation of a few decimal places in this value would cause the gravitational balance to disappear, making the existence of stars and galaxies, for example, impossible. The calculated value of the present entropy of the universe is  $10^{103}$ . Although both the values of the entropy of the universe, the Big Bang and the present one, are very high, the value of the Big Bang is lower, which implies the irreversibility of the processes in the universe as well as an initial order higher than the present one.

The early universe had a low entropy compared to the present value because there were no black holes at the beginning. The entropy of the entire Universe is mostly present in the background radiation left over from the Big Bang, and to a small extent in neutrinos. Since the elements of the universe that we easily observe, such as stars, galaxies, etc., have a negligible entropy compared to the entropy of the background radiation, it is easy to fall into the trap of considering that entropy changes significantly as the structure of the universe is formed, but this is only a coincidence, not the cause. It took tens of millions of years for the Universe to form its first stars and its first black hole. Until that happened, the entropy of the Universe, with an accuracy of more than 99%, remained unchanged. If there were no black holes, the entropy of the universe would have been almost constant for the last 13.8 billion years of the universe's

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<sup>105</sup> Roger PENROSE, *Mintea noastră...*, p. 614.

<sup>106</sup> *The second law of thermodynamics* postulates that "the passage of heat from a body with a given temperature to a body with a lower temperature is an irreversible process". In most of the formulations of the second law, it is specified that within this phenomenon of energy transfer, entropy always increases. Entropy is a physical quantity that characterizes the degree of disorder of the movement of molecules.

age. That primary state of the universe also had a considerable amount of entropy, but black holes have much more entropy and are easy to achieve from a cosmic perspective.

*The present state of the universe, which denotes a degree of order and correlation between the constituent elements, is related to the initial conditions of the universe and not to some intrinsic mechanism of the universe that directs the flow of time, giving the direction of evolution of the universe to its current planned state, according to the anthropic principle.*

Professor John Hands, who has devoted more than 10 years to evaluating current scientific theories, concludes that from a scientific point of view

"The current 'orthodox' explanation of cosmology<sup>107</sup> regarding the origin of matter and energy of which we are made does not belong to the scientific field."<sup>108</sup>

### **The Irreversibility of Time in the Universe**

In contemporary times, the attempt of the British scientist Roger Penrose to solve the mystery of the irreversible flow of time, considering the initial conditions of the universe responsible for it, is remarkable. *Since the observable universe is unique, it is difficult to distinguish between the laws of science that govern the universe and the initial conditions of the universe that govern these laws of science.* Penrose states that if the laws of science at the local level are symmetrical in terms of time, then the cause of statistical asymmetry at the global level is at the level of the initial conditions of the universe.

According to experience at the macroscopic level, the initial conditions of the universe involve an infinitely precise arrangement of the velocity distribution of the particles that make up the universe, requiring an infinite amount of information to obtain the present state of the universe. The lack of information implies an initial entropy with a value greater than zero. It has been shown that the existence of initial conditions of the universe that have low entropy in the future is a consequence of the second law of thermodynamics. The relatively small entropy of the current state of the universe, evidenced by the existence of stable structures in the universe, implies an entropy with an even lower value of the initial state. Thus, the conclusion

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<sup>107</sup> The term "orthodox model" in the context of cosmology refers to the Lambda Cold Dark Matter (ΛCDM) model. It is named "orthodox" because it represents the prevailing and widely accepted understanding of cosmology, supported by extensive empirical evidence, predictive success, and a comprehensive theoretical framework.

<sup>108</sup> John HANDS, *Cosmosapiens: Evoluția omului de la originile Universului*, Trad. de Carmen Strungaru și Doru Căstăian, București, Humanitas, 2019, p. 670.

is that *the irreversible evolution of the universe towards states with high entropy is caused by the conditions of the initial singularity with low entropy.*

In this regard, theologian Nicolae Vladimir Dobre, emphasizes the Orthodox theological teaching of the Creator Logos, using current scientific language:

"The process of entropy tells us that order cannot be achieved naturally. In other words, the initial state of the Universe, that state of maximum structuring from which everything started, could not be obtained spontaneously, but a certain amount of energy/information had to be "supplied". Which one, where could it come from? Well, the first chapter of the Gospel of John tells us that it comes from God Himself. But, of course, the language of the Gospel is not the same as the language of astrophysics, and in connection with this some clarifications are required. In this sense, the 'Word' spoken of in the Gospel is the [...] translation of the Greek term '*Logos*'.<sup>109</sup>

*The expansion of the universe does not explain the arrow of time, the irreversible flow.* Roger Penrose demonstrated that *there is no direct link between the expansion of the universe, the increase in entropy, and the arrow of time.*

The current universe presents ordered structures, specific to a low entropy, and according to the second law of thermodynamics, this corresponds to an initial state with even lower entropy, therefore even more orderly. If the entropy in the universe were currently large, then it would not be possible for the existence of ordered structures such as stars, galaxies, solar systems, etc.

Classical cosmology assumed that the state of matter at the Big Bang is in thermodynamic equilibrium, with an entropy value close to the maximum, even though all physical parameters are infinite at the initial singularity. The entropy of the universe has been considered to be an intrinsic attribute of matter. Observations of the present universe, however, contradict this assumption of maximum entropy at first.

To solve this paradox, Penrose states that it is necessary to analyze the degrees of gravitational freedom of the universe, that is, the initial conditions of the universe must be considered not only from the perspective of matter, but also from the perspective of the geometry of space-time, according to the relationships described by the general theory of

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<sup>109</sup> Nicolae Vladimir DOBRE, *De la Credință la Știință și înapoi la Credință. Puțină teologie pentru ingineri dar nu numai pentru ei*, București, Sophia, 2013, p. 94.



relativity. Thus, Penrose proposed adding the property of entropy to the gravitational field, called gravitational entropy (EG). By analyzing the possible volume of entropy that can occur in the universe throughout the evolution of the universe from the Big Bang to the final great implosion, the Big Crunch, Penrose discovered the lack of a large amount of entropy in the baryonic universe currently observed compared to the maximum possible. Thus, he considered that the low gravitational entropy of the Big Bang is responsible for the maximum ordering of the universe to the initial singularity and the subsequent planned and irreversible evolution towards a state of higher entropy. The initial order condition can be presented in geometric terms by the correspondence between the increase in gravitational entropy and the regrouping of matter accompanied by an increase in the level of anisotropy of the gravitational field, described by the Weyl-type curvature tensor (CW). Thus, Roger Penrose proposed a development scenario for the Universe that starts with gravitational entropy (GE) at a minimum level, involving low gravitational anisotropy, and develops towards a state of high entropy with high gravitational anisotropy. The brief description of the Weyl curvature hypothesis (ICW) proposed by Penrose is: The Weyl curvature tends to zero in all past singularities when the singularity is viewed from future directions. Thus, the ICW is considered as a special initial condition of the Universe, which cannot be derived from retrospective dynamics, so the solution of the arrow of time problem is not in the sphere of statistical physics but in the sphere of physics that precisely elaborates the laws of physics. In other words, *the irreversibility of perceived time cannot be explained by temporal statistical series, but by means of physical laws as yet unknown, which acted at the moment of the initial singularity of the Universe and which are external to the temporal statistical series, therefore belonging to the metaphysical. These laws that acted on the initial singularity of the Universe can only be intuited by observing their macroscopic effects in the current Universe, and can be associated with a development plan, according to the anthropic principle, imprinted on the universe in accordance with the second law of thermodynamics.* Thus, this consideration of Penrose's has a strong view similar to the Orthodox theological one of *Christocentric creation*.

Penrose uses phase space<sup>110</sup> to express the hypothesis that Weyl curvature (ICW) implies the existence of special conditions in the early universe, applicable to all possible universes.

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<sup>110</sup> Henry Poincaré in 1889 formulated the theory of dynamical systems. The basic element of nonlinear dynamics is represented by the dynamical systems, which have a purely deterministic character, being characterized by a law of evolution. In order to define a *dynamic system*, it is necessary to specify *the phase space*, which represents the set of all possible states of the system. It may in principle be any set, but in practical applications it is a differentiable manifold, being specified by its coordinates.

Thus, considering the maximum potential entropy for our universe to be  $10^{123}$ , Penrose estimates that the initial volume of phase space, corresponding to the special initial conditions of the universe, is  $V = 10^{10^{123}}$ . Our current universe, physically observable, has a volume of phase space  $W = 10^{10^{88}}$ . Thus, the relationship between the multitude of potential intelligible universes (V) and our physically observable universe (W) can be analyzed from the perspective of the initial conditions of our physically observable universe. The W/V ratio, which has an extremely small value of approximately  $10^{-10^{123}}$  from V, shows us that *the precision with which the Big Bang corresponding to our physically observable Universe must be triggered by the Creator tends to infinity*. The V/W ratio having an extremely high value, approximately , shows us that  $10^{10^{123}}$  *a quantity of information tending to infinity is necessary for the Creator in order to choose the Big Bang corresponding to our physically observable Universe, from the infinity of possibilities of the universes existing in V*. Expressed in probabilistic language, the priori probability for our currently physically observable Universe W, analyzed from the perspective of the model of the irreversibility of time, it is maximum.

### **The Anthropic Scope of the Universe Present in the Initial Singularity**

Penrose asserts that only an omniscient and omnipotent God could have created our physically observable Universe, since only He had the reason, the power, the science, and the information necessary to locate and utilize that extremely small part of the phase space, corresponding to the initial conditions of our physically observable Universe.

The observation of the existing order in the Universe and its description in current paradigmatic scientific language, leads to the conclusion that it is impressed on the Universe, in a contiguous way, making impossible the hypothesis that the various objects of our physically observable Universe could collaborate to achieve and develop the order towards a clear finality, to which the human intellect attributes a purpose and a plan. Thus, human reason appeals to the need for a rational cause that created our universe. Penrose considers that the law that determines the contingency of the Universe does not belong to any empirical causal series of the relationships between physical objects, but is transcendent to our physically observable Universe W. Thus, the infinity of possible universes, described by the infinite initial conditions in the space of phases V, as well as God the Creator are transcendent to our physically observable Universe W.

From the Orthodox theological point of view, the relationship between the infinity of potential intelligible universes V and our physically observable universe W does not in any way

show the creation of W from V, but the differentiation between the infinity of potential intelligible universes and our physically observable universe. Thus, W and V represent *the distinction (diaphora)* between created and uncreated. Thus, Penrose provides valuable scientific clues to the intelligible elements of creation *ex nihilo*. The irreversibility of time in W, with the aspects related to entropy, constitutes a particular fundamental element for W in relation to V. So, the ICW model proposed by Penrose is an attempt to present *the distinction (diaphora)* between W and V, from the perspective of W, that is, in paradigmatic scientific language, specific to our physically observable Universe. Thus, it can be concluded that the existence of *the distinction (diaphora)* in Penrose's model shows *the rationality (logoi)* common to both V and W, highlighting that both are created *ex nihilo*. Thus, seen from the Orthodox theological perspective, in our physically observable Universe W, *the rationality* of the irreversibility of time and implicitly *the rationality* of the complexity of the order that highlights the existence of a plane, are based on *the rationality (logoi)* of creation, which have their source in *the Logos (Reason, Wisdom)* of God. Thus, science's attempt to explain the source of the irreversibility of time through the special initial conditions of the Universe, implies framing exclusively in the context of the dogmatic theological perspective of creation *ex nihilo*. It is found that it is *precisely the problem of the irreversibility of the time that presents the fundamental contingency in the Universe, which determines the opening of contemporary cosmological science to explanations from the metaphysical sphere of philosophy and theology*. Thus, the irreversibility of time in our physically observable Universe is related to the transcendent, ineffable and unknowable existence of *the Logos* of God.

### **Fine-tuning of the Universe**

According to the analysis of the observable data of the universe from the perspective of the current scientific paradigm, it appears that our observable Universe had to meet extremely precise initial conditions. According to the explanations of Prof. Andrei Linde from the Department of Physics at Stanford University<sup>111</sup>, the initial conditions of the Universe that allowed the energy density to be close to the critical value, making it possible to evolve our universe to the current state, imply the need to add an inflationary phase to the Big Bang theory. According to the inflationary phase<sup>112</sup>, in a tiny fraction of the first second  $10^{-35}$ s, the Universe

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<sup>111</sup> Andrei Linde, "Inflation, Quantum Cosmology and the Anthropic Principle", in "Science and Ultimate Reality: From Quantum to Cosmos", honoring John Wheeler's 90th birthday. J. D. Barrow, P.C.W. Davies, & C.L. Harper eds. Cambridge University Press (2003)

<sup>112</sup> John HANDS, *Cosmosapiens: Evoluția omului de la originile Universului...*, pp. 54-64.

had an accelerated expansion, increasing from the initial Planck<sup>113</sup> size of about  $10^{-33}$ cm to the immense size of about  $10^{10^{12}}$  cm.

Observations of the cosmic microwave background have played a crucial role in confirming the inflation theory. In particular, two space missions have provided significant data in this regard: the Cosmic Background Explorer (COBE)<sup>114</sup> and the Wilkinson Microwave Anisotropy Probe (WMAP).<sup>115</sup> These NASA missions provided clear evidence of the anisotropies of the cosmic microwave background, confirming that the early universe was affected by quantum fluctuations that developed and were extended during the inflationary period. This confirmation has significantly contributed to the consolidation of the inflation theory as an integral part of the Big Bang model and has helped to form a consensus in the scientific community on the validity of this model.

NASA's Wilkinson Microwave Anisotropy Probe (WMAP) mission<sup>116</sup> was crucial in providing significant confirmations of the Big Bang model and inflation theory, providing a solid foundation for understanding the early evolution of the universe. WMAP observations were later extended and improved by other missions, such as the European Space Agency's (ESA) Planck, contributing to an even more precise understanding of the origins and structure of the universe.

Martin Rees, professor at the University of Cambridge, explains *Fine-tuning* of the universe<sup>117</sup>, centered on *the anthropic principle*, by the existence of only six fundamental constants<sup>118</sup>:

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<sup>113</sup> *The Planck dimension* is an extremely small scale at which the laws of physics, as we know them, come together in a unique way. In physics, it is considered the limit at which the quantum effects of gravity become important. At this scale, about  $10^{-35}$  meters, it is considered that space and time become discrete (discontinuous), and the classical concepts of space and time are no longer applicable. It is the point at which Einstein's general theory of relativity and quantum mechanics can no longer be applied.

<sup>114</sup> COBE (1989-1996) was crucial in confirming the homogeneity of the cosmic microwave background, as well as the first detection of its anisotropies. In 1992, *the Cosmic Background Explorer (COBE)* provided the first clear evidence of small anisotropies in the cosmic background radiation, showing that its temperature is not perfectly uniform, but shows small variations across the scale of the entire sky. These results were consistent with the predictions of inflation theory, which suggested that these small variations in radiation should exist and should reflect the primordial quantum fluctuations extended and strengthened during the inflationary period.

<sup>115</sup> WMAP (2001-2010) was launched to make precise measurements of the anisotropies of the cosmic microwave background. It provided detailed maps of these anisotropies and made highly accurate measurements of their characteristics as well as the relevant cosmological parameters. *The Wilkinson Microwave Anisotropy Probe (WMAP)* confirmed and expanded on many of the COBE findings, providing data that allowed for more precise testing of cosmological models, including those related to inflation.

<sup>116</sup> "Wilkinson Microwave Anisotropy Probe". NASA, accessed November 17, 2023, <https://map.gsfc.nasa.gov>

<sup>117</sup> John HANDS, *Cosmosapiens: Evoluția omului de la originile Universului...*, pp. 130-133.

<sup>118</sup> Martin REES, *Doar șase numere. Forțele fundamentale care modelează universul*, trad. Irinel Caprini, Humanitas, București, 2008, pp. 10-12.

- a)  $N$  (*Dirac's large number*)<sup>119</sup> is the number that measures the intensity of the electric forces that hold the atoms together, divided by the value of the gravitational intensity between them, having a value of  $10^{36}$ . If  $N$  had been different, the life of the universe would have been very short, insufficient for evolutionary development toward the goal of the emergence and maintenance of intellectual human life that can comprehend the universe.
- b)  $\mathcal{E}$  (*epsilon*) Represents the efficiency of converting mass into energy in stars (especially in nuclear fusion reactions), having a value of 0.007. This is related to the strong nuclear force. If it had been slightly larger or smaller, the chemical elements necessary for life could not have formed.
- c)  $\Omega$ , *the cosmic number*, measures the amount of matter in the universe (including "dark matter") that is characterized by gravity (attraction), relative to the expansion energy of the universe, having a small value of about 0.3. It measures the expansion rate of the universe, finely tuned to allow for the existence of galaxies, stars, chemical elements, etc.
- d)  $\lambda$  represents *the cosmological constant*, which is associated with *vacuum energy* or *dark energy* and represents a measure of antigravity responsible for the expansion of the universe.  $\lambda$  has a small value of about 0.7. If it had any other value, then it would not have been possible for the universe to evolve towards the purpose of the emergence and maintenance of human life.
- e)  $Q$  has a value of about  $10^{-5}$  and represents the amplitude of the density fluctuations of matter in the early universe, which are essential for the formation of the cosmic structures we see today, such as galaxies, galaxy clusters, and superclusters.  $Q$  expresses a fraction of the total resting energy ( $mc^2$ ) of the clear structures of matter in the universe (stars, galaxies, clusters of galaxies) needed to hold them together (by gravity) or to

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<sup>119</sup> *Dirac's large number* refers to an observation made by physicist Paul Dirac in 1937 regarding the relationships between the dimensions of the large-scale and subatomic scale universes, noting that the ratios are often around  $10^{40}$ . These observations include:

- a) the ratio between the size of the observable universe ( $10^{26}$  meters, approximately equal to the Hubble radius) and the size of a proton ( $10^{-15}$  meters, given by the Compton wavelength) is about  $10^{40}$ .
  - b) the ratio of electromagnetic forces to gravitational forces between two elementary particles, for example two protons is about  $10^{36}$ .
  - c) the ratio between the radius of the electron and that of the observable universe is of the order of  $10^{40}$ ;
  - d) the ratio between the age of the universe (about 13.8 billion years) and the time it takes for light to pass through a proton (about  $10^{-24}$  seconds) is of the order of  $10^{40}$ ;
  - e) the ratio of gravitational attraction to the observed electrostatic attraction between a proton and an electron is  $10^{39}$ . Between two electrons, this ratio is about  $10^{42}$ .
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disperse them. The density fluctuations in the early universe were very small, but sufficient to initiate the formation of cosmic structures by gravitational collapse, but not so large as to disrupt the large-scale homogeneity of the universe.  $Q$  has exactly the necessary value that allows galaxies, stars, chemical elements and life to exist. If  $Q$  had been smaller, the universe would have been too smooth and matter could not have compressed to form galaxies, and if  $Q$  had been larger, the universe would have been too turbulent to allow matter to be organized into ordered structures.

- f)  $D$  represents the number of spatial dimensions of the universe and has the value 3. Three spatial dimensions are essential for the stability of planetary orbits and for the complex structure necessary for life. Fewer dimensions would lead to gravitational collapse, and more would make the laws of physics unstable and incomprehensible to intellectual human life.

Martin Rees also notes the contingent character of the laws of science and the *fine-tuning* of the universe, and it is necessary to involve the metaphysician in their explanation:

"Our everyday world, simply shaped by subatomic forces, also owes its existence to the well-regulated speed with which the universe expands, the processes of galaxy formation, the appearance of carbon and oxygen in old stars, etc. A few basic physical laws give the "rules"; our emergence from a simple Big Bang depended sensibly on the six "cosmic numbers". If these numbers had not been "well-tuned", the gradual unfolding of the successive layers of complexity would have stopped in its tracks. [...] We must look for other reasons for the providential values of the six numbers."<sup>120</sup>

Professor Owen Gingerich states the following about fine-tuning in the early moments of the universe:

"To achieve a balance between the expansion energy and the braking forces of gravity required extraordinary precision – such precision that it seems that the universe was designed specifically for humanity. The Big Bang is the classic example of "fine-tuning", as astrophysicists and cosmologists call it, and at that moment the universe was indeed fine-tuned. If you're looking for a project, how about that? Surely a benevolent Creator worked to produce the universe suitable for intelligent life!"<sup>121</sup>

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<sup>120</sup> Martin REES, *Doar șase numere...*, pp. 209-210.

<sup>121</sup> Owen GINGERICH, *Universul lui Dumnezeu*, Trad. Viorel Zaicu, București, Curtea Veche, 2010, p. 64.

The Anglican physicist and theologian John Polkinghorne notes regarding the fine-tuning of the universe:

"This world that began so simple has become, after fifteen billion years, immensely rich and complicated. You and I are the most complicated known consequences of this fruitful history. A universe that, when it was ten thousand millionths of a second old, was only a hot soup of elementary particles, became the abode of saints and scientists. Remember that this was only possible because the universe has a fine tuning built into its physical fabric."<sup>122</sup>

Professor Owen Gingerich notes with regard to *fine-tuning* that:

"We humans are the most extraordinary creatures known [...] As physicist John Wheeler once suggested to me, perhaps the universe is like a large plant whose ultimate goal is to produce an extraordinary little flower. Maybe we are that little flower."<sup>123</sup>

From the Orthodox theological point of view, Alexei Nesteruk emphasizes *the fine tuning* of the constants of the universe<sup>124</sup> without which the emergence of human life would not have been possible, and in contemporary Romanian Orthodox theology, Professor of Orthodox dogmatic theology Adrian Lemeni and Father Răzvan Ionescu offer an extensive analysis of this<sup>125</sup> theme.

**"All Things Were Created Through Him and for Him" (Colossians 1:16) and  
All Things will be Brought (Recapitulated) Under the Same Head, Christ:  
"Anakephaleosasthai ta Panta en to Christ" (Ephesians 1:10)**

In the search for a profound understanding of the universe and man's place within it, the dialogue between theology and science has revealed surprising and fertile convergences. One such point of convergence is the meeting between *the anthropic principle* and Orthodox theology *Christocentric*. This section aims to explore how these two perspectives, one scientific and the other theological, meet and enrich each other.

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<sup>122</sup> John POLKINHORNE, *Quarci, haos și creștinism*, București, Curetea Veche, 2006, p. 52.

<sup>123</sup> Owen GINGERICH, *Universul lui Dumnezeu...*, p. 56.

<sup>124</sup> Alexei NESTERUK, *Universul în comuniune*, trad. Mihai-Silviu Chirilă, București, Curtea Veche, 2009, p. 259.

<sup>125</sup> Adrian LEMENI, Pr. Răzvan IONESCU, *Teologie și știință. Repere pentru un dialog*, București, Ed. Institutului Biblic și de Misiune a Bisericii Ortodoxe Române, 2007, p. 392.

The anthropic principle, enunciated within modern cosmology, indicates that the universe is "fine-tuned" to allow for the existence of rational human life that has consciousness. This implies that the laws of science and the fundamental constants of the universe are adjusted with extraordinary precision to make possible the emergence and evolution of human life. Observations supporting this *anthropic principle* raise profound questions about the purpose and meaning of the universe, indicating that it is not a product of chance, but of a plan.

On the other hand, Orthodox theology argues that all creation has meaning and purpose *Christocentric*, which are revealed in and through the person of Jesus Christ, the Man *Logos*. According to this perspective, the universe is not just an impersonal mechanism, but a creation full of God's intentionality, oriented towards fulfillment in Jesus Christ. This theological vision sees in the Man Christ not only the Creator *Logos*, but also the ultimate goal of all creation, thus giving it ultimate reason and meaning.

Convergence between *the anthropic principle* and the *Christocentricity* of Orthodox theology it manifests itself in the way both perspectives recognize a deep reason, a plan, and a purpose imprinted in the fundamental structure of the universe. While *the anthropic principle* indicates a precise planning of the physical constants of the universe to allow rational human life, Orthodox theology sees in this *fine-tuning* of the universe an expression of God's Wisdom and love, manifested in, through and for Jesus Christ, the *Logos Incarnated*.

Today, according to the Patristic Tradition, St. Luke of Crimea reaffirms that Holy Scripture is not to be considered as a substitute for scientific endeavor, emphasizing the Christocentrism of creation:

"The Bible does not teach about a physical center, but about a metaphysical center of the universe which is Christ the *Logos* (for it does not contain teachings about transient physical things, but about eternal and spiritual things) [...] The world is Christocentric. [...] This immeasurable cosmos (the macrocosm) is Christocentric, as is the small world of our being (the microcosm)."<sup>126</sup>

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<sup>126</sup> Sfântul Luca al Crimeii, *Știința și religia*, Doxologia, trad. Denis Chiriac, Iași, 2018, p. 67.



The fulfillment of man is related to Jesus Christ, "for in him were made all things, things in heaven and things on earth, things visible and things invisible, whether thrones, or lords, or beginners, or masters. All things were made through Him and for Him." (Col 1:16). The Orthodox exegesis of this verse highlights not only the Godly and creative nature of Christ, but also the personal relationship He has with creation. Creation is not merely an abstract work, but has a personal purpose and an intimate connection with the Holy Trinity through *the Logos Incarnated*. The expression "in Him" emphasizes that Christ is not only an instrument in the process of creation, but its Architect and Maker, because in the Holy Trinity there is a unity of being, will and work. Through Him, the entire universe was brought into existence out of nothing, which emphasizes the all-powerful and divine creative nature of the Savior Jesus Christ. The statement "for Him" emphasizes that all creation is not a purposeless or unconditional process, as one might think. Creation has a purpose, and that purpose is Jesus Christ Himself, the development towards the goal being governed by Him as *the Creator Logos*. Creation exists for the purpose of knowing Him, giving Him glory, reflecting His greatness, and serving Christ. Only in this way can man be fulfilled, because "God made us to know Him"<sup>127</sup>. He created us out of love, with love and for eternal communion of love. Father Dumitru Stăniloae states that in relation to the world

"He perfects man's being, gathering together the reasons of the world, and thereby making his reason and the reason of the world effective in himself through the virtues, so that by surpassing his reason and the reasons of the world, he may at the same time become the purest possible mirror of the divine Reason and goodness from which they radiate."<sup>128</sup>

Creation is the gift of God the Father to His Son, Christ Jesus. Thus, the *Christocentrism of creation is affirmed*, the meaning and purpose of creation being Jesus Christ<sup>129</sup> truly Man and truly God. The procurator Pilate, intuiting the divine origin of Jesus Christ, emphasized this truth when he said: "*Behold the Man*" (Jn 19:5). The Holy Fathers affirm that God became man in order to make man godly. The statement of St. Gregory the Theologian is well known: "*hina*

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<sup>127</sup> Pr. Prof. Acad. Dr. Dumitru STĂNILOAE, *Studii de Teologie Dogmatică Ortodoxă*, Craiova, 1991, p. 163.

<sup>128</sup> Dumitru STĂNILOAE, nota 154, la Sfântul Maxim Mărturisitorul, *Ambigua*, trad. de Pr. Prof. Dumitru Stăniloae, Editura Institutului Biblic și de Misiune a Bisericii Ortodoxe Române, București, 2006, p. 205.

<sup>129</sup> Diac. Adrian Sorin MIHALACHE, *Lumina Celui Nevăzut: O privire teologică în raționalitatea creației și teoriile științifice recente despre Univers. Vol. I*, București, Basilica, 2016, p. 415.

*ghenomai tosouton theos hosan ekeinos anthropos* - so that I may become godly as much as He became man<sup>130</sup>.

The universe is created by God with a *Christocentric meaning and purpose*, according to "His will, according to His good pleasure which He purposed in Himself, that the dispensation of the fulness of the times He might gather together in one all things [ἀνακεφαλαιώσασθαι]<sup>131</sup> in Christ" (Ephesians 1:9-10)<sup>132</sup>. St. Paul emphasizes that the ultimate goal of God's plan is for all things in creation to be brought (recapitulated) under the same Head, Christ ("*anakephaleosasthai ta panta en to Hristo*"), in order to be renewed. In the Vatopedi version of *the New Covenant*, *anakephaleosasthai* is translated as "recapitulation"<sup>133</sup>. Thus, the central role of the Lord Jesus Christ in salvation and in the renewal of the entire cosmos in the "new heaven and new earth" is emphasized.

In this sense, Blessed Theodoret of Cyrus teaches in the interpretation of the Epistle to the Ephesians:

"Being gathered together in Christ, all things in heaven and things on earth in Him [...]. Therefore 'reunion' calls the sudden change of things, for through the incoherence of the Lord Jesus Christ the nature of men rises and puts on incorruption, and the visible creature, delivered from death, acquires purity, and the multitudes of the invisible spend in joy, because pain, sorrow and sighing have perished."<sup>134</sup>

In the present Orthodox theology, it is emphasized that:

"The union of all created things is possible precisely because, for its view, all things were made from the beginning; that the whole world, including here the universe and all others, may become the Church of God, and man may be His Priest in it, so that through the union of

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<sup>130</sup> Sfântul Grigorie de Nazianz, *Cele cinci Cuvântări Teologice*, Ed. Anastasia, 1993, p. 67.

<sup>131</sup> The Greek term "ἀνακεφαλαιώσασθαι" (*anakephalaiōsasthai*) is usually translated as "to unify under one head" or "to recapitulate". It comes from the Greek word "κεφαλή" (*kephalē*), which means "head". In a broad sense, "κεφαλαίω" (*kephalaiōō*) means "to summarize", "to summarize", "to gather" or "to unify under one head". The prefix "ἀνα-" (*ana-*) indicates a movement of reunion or renewal. Combined, the term signifies the dynamics of the work of bringing all things under one head or recapitulating towards renewal.

<sup>132</sup> *The Orthodox Study Bible*, Prepared under the auspices of the Academic Community of St. Athanasius Academy of Orthodox Theology, Elk Grove, California, USA, Thomas Nelson Publishers, 2008.

<sup>133</sup> *Noul Testament - Sfânta Mare Mănăstire Vatoped*, Ediție bilingvă, Ed. Sfânta Mare Mănăstire Vatoped - Sfântul Munte Athos, Grecia, 2022.

<sup>134</sup> Fericitul Teodoret al Cirului, *Tâlcuire la epistolele Sfântului Apostol Pavel*, Vol. 1, Trad. Iulia cărare și Mircea Ștefan, Iași: Doxologia, 2015, pp. 63-64.

man with God, all that is in the world may be gathered together in him, and united with him."<sup>135</sup>

The whole of creation is *Christocentric*, and the Church is *Eucharistic*. The Church celebrates the Eucharist at the Holy Liturgy, and the Eucharist is, par excellence, the Mystery of the Church. It is an indissoluble two-way link. Theologian Sergei Bulgacov pointed out that:

"The miracle of the transformation of gifts is not physical but metaphysical. *μετά* = *after, beyond, trans, pre, and μεταβολή* (= *transformation, transformation, transmutation or transposition*) does not mean the change of one material essence into another within the limits of the physical world, but *the union* of two worlds, of two separate domains of nature: physical and metaphysical, a *metaphysical transcendence*".<sup>136</sup>

The Holy Apostle Paul emphasizes the communion of men and angels in the Holy Liturgy, when through the synergistic liturgical service, we foretaste together the eighth day of the "new heaven and the new earth", advancing in the spiritual knowledge of God, through the full communion with Jesus Christ:

"Are they not all ministering [λειτουργικά] spirits, sent forth to minister [διακονίαν] for those who will inherit salvation?" (Heb 1:14)<sup>137</sup>

Man is like the angels, so he too is fulfilled by participating in the Holy Liturgy, and he is a liturgist like the angels, aiming together with the angels, especially the Cherubims<sup>138</sup> (כְּרוּבִים, kerubim in Hebrew), to know God more and more. After the Seraphims (Isaia 6), stand before God the wise Cherubims (Ezekiel 1 and 10)<sup>139</sup>, the many-eyed ones, who, more than other hosts of angels, shine unceasingly with the light of understanding and knowledge of God. The cherubim being enlightened in the mysteries of God, of the profound knowledge of God and of divine wisdom, enlighten others also. Through the Cherubim the wisdom from above is

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<sup>135</sup> Dan CHIȚOIU, Pr. Petre COMȘA, Sorin MIHALACHE, Costea MUNTEANU, "Raționalitatea creației...", p. 222.

<sup>136</sup> Serghei BULGACOV, *Dogma euharistică*, trad. Pr. Paraschiv Angelescu, București, Paidea, 2000, p. 9.

<sup>137</sup> *The Orthodox Study Bible*, Prepared under the auspices of the Academic Community of St. Athanasius Academy of Orthodox Theology, Elk Grove, California, USA, Thomas Nelson Publishers, 2008.

<sup>138</sup> In Christian Orthodox theology, cherubims (כְּרוּבִים, kerubim) are celestial beings of high rank, serving as attendants of God's throne, full of divine wisdom, protectors of holy places, and models of ministering [λειτουργικά]. They play a significant role in both the theological framework and liturgical life of the Orthodox Church, reminding the faithful of the transcendence, holiness, and glory of God. Cherubim play a significant role in Orthodox liturgy, particularly in the Cherubic Hymn, which is sung during the Holy Liturgy. This hymn calls the faithful to lay aside earthly cares and join with the cherubim in worshiping God.

<sup>139</sup> Ezekiel's vision provides a detailed and complex description of cherubims. They are depicted with four faces (a man, a lion, an ox, and an eagle) and four wings. Their appearance includes elements like wheels within wheels and eyes all over, symbolizing omnidirectional movement, perception and awareness.

poured out and the soul's eyes are given enlightenment to the knowledge of God. So, man is by his being liturgical, liturgical and is naturally called to know God especially in the Holy Liturgy, in a profound ministering [λειτουργικὰ] collaboration with God loving angels. Only in this way the man can be fulfilled.

„And this is eternal life, that they may know [γινώσκωσιν]<sup>140</sup> You, the only true [ἀληθινὸν] God [Θεὸν], and Jesus Christ whom You have sent.” (John 17:3)<sup>141</sup>

Man is fulfilled by partaking of the *Logos Incarnated*, the model and source of his perfection. But the transformation of gifts cannot and must not be the object of sensory perception, scientifically analyzed, because it concerns exclusively the knowledge of the physical reality of this world. The transformation of gifts, just like the humanity of the *Logos*, since it involves the union of two worlds, the physical and the metaphysical, without confusion and without mixing, without changing their reason of being, and is therefore completely imperceptible to the bodily sensory system, is therefore imperceptible and inaccessible to physical perception. Only spiritually, through spiritual extrasensory perception, can the reality of humanity, the *Logos* and the Eucharistic reality be known.

John Meyendorff emphasizes that the life of the Church, centered on the Eucharistic experience, goes beyond the daily human logic, affirming:

"Christ, after the Resurrection and Ascension, left us the memory of the encounter with Him, then expressed by the Church, not only from the historical point of view, but also from the Eucharistic and eschatological point of view, as an act of communion with God in His Kingdom. But this communion is ontologically different from what involvement means by natural law and causality. The absence of causal dynamics, so essential to the things of the empirical universe, is here replaced by the work of the divine agent, the Holy Spirit. [...] When the Church remembers the Christic event in the Eucharist, she calls the name of God into His kingdom; in doing so, it transcends space and time to live the presence of Christ (the Christ

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<sup>140</sup> The term γινώσκωσιν (ginōskōsin) in John 17:3 is derived from the verb γινώσκω (ginōskō), which means "to know" or "to recognize." In the context of John 17:3, this term is used in the subjunctive mood, indicating an action that is desired or intended. In this verse, γινώσκωσιν (ginōskōsin) is translated as "they may know." It signifies a deep, personal, and experiential knowledge of God and Jesus Christ, which is characterized as the essence of eternal life. The use of this term emphasizes not just intellectual understanding but an intimate relationship and recognition of God and Jesus Christ.

<sup>141</sup> *The Orthodox Study Bible*, Prepared under the auspices of the Academic Community of St. Athanasius Academy of Orthodox Theology, Elk Grove, California, USA, Thomas Nelson Publishers, 2008.

event), in the eternity of His kingdom."<sup>142</sup>

Regarding the Unity of creation and the Church in the Logos of God, Father Prof. Dumitru Stăniloae states:

"Apart from God, unity, and therefore salvation, is not possible. Christ expands with His sacrificed and risen body in us, to unite us and make us like Him, filling us with the same love of His for God the Father."<sup>143</sup>

Professor Adrian Lemeni notes that Father Professor Dumitru Stăniloae has a perspective of the dialogue between theology, philosophy and science that could be a fruitful tool to discover the profound identity of reason, open to the vision given by faith and ecclesial experience<sup>144</sup>.

### Conclusions

Today, perhaps more than ever, science is theology's best friend, since it has crushed all the idolatry of the god of ignorance: "We believe in a divinity because we cannot understand certain phenomena in nature"; and thus, only true faith remains: "I trust God because I can know Him in an interpersonal relationship, of cooperation, of communion, fully in Jesus Christ in His Church."

Thus, science in its approach being limited only to physical objects, it can only note the involvement of metaphysics in the creation and maintenance of the universe, and scientific observations cannot be separated from the consciousness of the observer. So, science cannot be used to disprove the existence of God.

*Both the Scientific Method and the Orthodox Spiritual Theological Method (theognosia) are based on the rejection of knowledge obtained exclusively rationally, without practical experimental validation. Also, both methods have a repetitive character of practical experience. In Orthodox theology, every person, from every time and place, who experiences God in the Church, centered in the Eucharist, goes through the same stages of dispassion, illumination and*

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<sup>142</sup> Alexei V. NESTERUK, *Lumina de la răsărit...*, p. 116.

<sup>143</sup> Pr. Prof. Dumitru STĂNILOAE, *Teologia Dogmatică Ortodoxă, vol 2...*, pp. 263-264.

<sup>144</sup> Adrian LEMENI, "References of Father Dumitru Stăniloae's Thought in the Dialogue between Theology and Science", in *Orthodox Christianity and Modern Science: Theological, Philosophical, Scientific and Historical Aspects of the Dialogue*, ed. by Christopher C. Knight and Alexei V. Nesteruk, SOC, 2 (Turnhout, 2021), pp. 155–163.

deification (*Christomorphization*). The Saints and the testimony of Tradition is eloquent in this regard.

The followers of the implicit argumentation of the rationality of the universe affirm that there is a close connection between the order of the world and conscious human reason.

The two great theories of the current scientific paradigm, the theory of relativity and quantum mechanics, although incompatible<sup>145</sup> in terms of defining fundamental notions such as space, time, cause-effect relationship, observer-observed system relationship, nevertheless provide an overview of the universe on a macroscopic and microscopic scale, based on discontinuous explanatory levels. Thus, it is found that reality is composed of discontinuous elements, confirming the vision of the scientist Max Planck<sup>146</sup>.

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<sup>145</sup> The incompatibility between the theory of relativity and quantum mechanics is one of the great challenges of contemporary theoretical physics. This stems from the fact that these two theories, which have been remarkably successful in explaining phenomena on a macroscopic and microscopic scale, respectively, come into conflict under certain conditions. Here are some examples:

*a) Scale of Different Sizes:*

*Theory of Relativity:* It is effective in describing phenomena on a cosmic scale and objects with high mass or very high speeds. It was developed by Albert Einstein to describe the gravity and motion of objects under extreme conditions.

*Quantum Mechanics:* It works very well on a microscopic scale, covering the behavior of subatomic particles.

*b) The Nature of Time and Space:*

*Theory of Relativity:* It postulates that time and space are relative and can be influenced by gravity and high speeds.

*Quantum Mechanics:* It treats time and space in a totally different way, incompatible with the theory of relativity and ignores gravity.

*c) Determinism vs. Probability:*

*Theory of Relativity:* It is a deterministic theory, where the trajectories of objects can be accurately predicted under certain conditions.

*Quantum Mechanics:* It is a probabilistic theory. It describes the state of a subatomic system through a wave function, and the results of the measurements are probabilistic.

*d) Interactions with the Gravitational Field:*

*Theory of Relativity:* Includes gravity described as a curvature of space-time.

*Quantum Mechanics:* Ignores gravity.

*e) The need for a quantum theory of gravity:*

The theory of general relativity has not yet been successfully quantified, which would be necessary to merge it with quantum mechanics into a theory of all fundamental forces.

Researchers are trying to resolve this incompatibility by developing new theories, such as string theory and quantum gravity theory, that could reconcile these two fundamental descriptions of the physical world.

<sup>146</sup> Max Planck is known for his fundamental contributions to the development of quantum theory, and the concept of "*discontinuous reality*" is associated with his ideas in this field. This concept was a consequence of his research on blackbody radiation and constituted a significant paradigm shift in the understanding of the nature of matter and radiation. The main aspects related to "*discontinuous reality*" in the context of quantum theory are:

*a) Energy Quanta:* Planck introduced the idea that energies emitted or absorbed in electromagnetic processes, such as radiation, are quantized and cannot have any value. This was a fundamental approach, as it went against the classical idea that energy exchanges would take place continuously, with any quantity being possible.

*b) Quantum of Action:* Planck introduced the fundamental constant known as the "quantum of action" (also called the Planck constant), denoted by  $h$ . This indicates the minimum amount of action (energy x time) in a quantum system and is essential in defining energy quanta.

*c) Quanta of Light:* Later experimental observations, such as those on the photoelectric effect, supported the hypothesis that light itself may have the characteristics of discrete particles called photons, and this was another confirmation of the reality of discontinuity in the quantum world.

Orthodox theology considers that the purpose of the knowledge process is neither to grasp the various planes (physical and metaphysical) of the created world, nor to succeed in scientific explanations of the way the universe works, but it is to explain their existence in relation with God their Creator. Man's work of knowing the distinct planes of reality, microcosm and macrocosm, in the specific fields of science and the arts, must continue with the work of integrating all things, from all levels of reality. The union of all the elements of creation is possible only in *Logos* Jesus Christ, by the grace of the Holy Spirit.

Despite the discontinuous nature of the Universe's levels of reality, the unitary character of the physical world remains unaltered. At the macroscopic level, matter and energy do not exist separately, they are essentially the same thing, as evidenced by the Theory of Relativity. Also, space and time cannot be analyzed separately, but only together in the space-time continuum presented by the Theory of Relativity. The interactions between space-time, matter-energy are elegantly presented by the equations of the Theory of Relativity. On the other hand, at the subatomic level, Quantum Mechanics presents the impossibility of separation between the observer and the impact on the measurement results. In other words, a human observer can only measure a system through an intervention that will disrupt the system, highlighting the existence of an indissoluble link between the conscious human observer and the observed system. Also, the mode of existence of matter at the subatomic level, described by the particle-wave duality, presents a level of subatomic reality that is extremely difficult to understand, being even more difficult to explain.

Scholars who adhere to the implicit rationality of the universe consider knowledge to be limited in principle. The purpose of the scientific endeavor is to provide approximate representations of the reality of the universe, with increasing degrees of precision. The exact prediction, deterministic according to the classical cause-effect mechanism, does not exist. The mode of existence of subatomic particles, described by wave-particle dualism, implies the existence of non-determinism at the fundamental level and the impossibility of precise representation based on the cause-effect mechanism, in a continuous space and continuous time. *Heisenberg's Uncertainty Principle* eliminated the concept of knowing the future based on the cause-effect mechanism, demonstrating that the current state cannot be measured exactly, with

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These concepts were central to the development of quantum theory, which had significant implications for understanding the behavior of matter and radiation at atomic and subatomic scales. The idea of "discontinuous reality" emphasized that nature at the quantum level is intrinsically different from how we would expect it to behave on a macroscopic scale, representing an essential shift in the paradigm of classical physics.

profound philosophical implications<sup>147</sup>. This principle has had a significant impact on scientific philosophy and has redefined the way we perceive and understand the world at the quantum level. He stressed that this is not only a limitation of our measurement technology, but is rooted in the very quantum nature of subatomic particles.

We find that the scientific approach includes investigations of phenomena that cannot be exhaustively studied only through the scientific approach. The tools of science have existential limits that cannot be crossed, also the mathematical apparatus also has maximum limits of precision, and human reason has limits<sup>148</sup>.

Science, despite its significant advances, has limitations, some of the most important being:

- 1) *Limitations of Measuring Instruments*: The performance of our measuring instruments imposes a direct limit on the precision and accuracy with which we can perform experiments and collect data.
- 2) *Absolute Ignorance*: Science never provides absolute knowledge. Any theory or law may be modified or supplemented by subsequent discoveries. Thus, scientific knowledge is always provisional and open to revision.

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<sup>147</sup> *The uncertainty principle*, formulated by the German physicist Werner Heisenberg in 1927, being one of the fundamental concepts of quantum mechanics, describes a fundamental limit of the precision with which the position and momentum (mass multiplied by velocity) of a quantum particle can be measured simultaneously. Consequences:

a) *Limit for Position and Momentum*: It is not possible to accurately measure both the position and the momentum of a particle simultaneously. The more accurately we measure the position of a particle, the greater the uncertainty associated with its momentum, and vice versa.

b) *Limit to scientific knowledge*: The uncertainty principle presents a fundamental nature of uncertainty in the quantum world and indicates our limitations in simultaneously knowing both the position and the motion of particles at the quantum level.

<sup>148</sup> The limitations of human reason can arise in various ways and in different areas of human thought. Here are some of the aspects that highlight the limits of human reason:

a) *Incomplete knowledge*: Despite significant advances in scientific research and other areas, our knowledge is limited. There are many aspects of the universe, the human mind, or human nature that are not yet fully understood or discovered.

b) *Thinking Errors and Bias*: People are susceptible to logical and thinking errors. Our thinking can be influenced by biases, personal perspectives, and other cognitive biases that can affect the decision-making process.

c) *Limitations of Cognitive Ability*: People have a limited ability to process information. We can be overwhelmed by the amount of data or information and have difficulty dealing with complex situations or taking into account all relevant variables.

d) *Subjective Perspectives*: Our thinking is inevitably filtered through the lens of our personal experiences and the cultural context in which we are rooted. This can create limitations in our understanding of other perspectives and in approaching problems objectively.

e) *Ambiguity and Uncertainty*: There are situations in which the available information is ambiguous or incomplete. In such cases, human reason may have difficulty reaching certain conclusions or making definitive decisions.

f) *Ethical and Moral Boundaries*: What is considered rational may vary depending on ethical and moral norms, and these may vary significantly between cultures and individuals. Therefore, what is rational for one person may not be rational for another, depending on values and beliefs.



- 3) *Limitations of Modeling and Simulation*: Even the most advanced models and simulations have limits. They cannot fully reproduce all aspects of nature's complexity and depend on the accuracy of input data and algorithms.
- 4) *Communication of Complexity*: Explaining highly complex phenomena in an accessible way can be difficult. This can lead to misunderstanding or oversimplification of complex concepts.
- 5) *Ethical and Social Limitations*: Science must respect ethical and social limits. Certain types of research may be considered ethically unacceptable or may raise questions about human rights and their impact on society.
- 6) *Reproducibility Issues*: Some studies cannot be independently replicable, and this has led to growing concern about the validity of results and the quality of research.
- 7) *Limitations of Human Knowledge*: There are fundamental questions that science cannot currently answer, and some aspects of the universe may remain philosophically incomprehensible to the human mind.
- 8) *Limitations in understanding Consciousness*: Human consciousness and its nature are still insufficiently understood. Understanding cognitive processes and the subjective nature of experiences remains a complex scientific field of research.

The recognition of these limitations does not diminish the value of science, but demonstrates a humble and realistic approach to knowledge and discovery. It is important to be aware of the limitations of science while appreciating and using what it offers us.

$N$  (*Dirac's large number*) present in *the fine tuning* of the universe, indicates *the anthropic principle*, explaining that the moment, the development that we humans observe in the universe is not accidental, but is according to the plan of universe, having the Christocentric scope. It is found that the period in the history of the universe conducive to the emergence and maintenance of intellectual human life capable of understanding the universe, corresponds to the current age of the universe. Current cosmological models and precise measurements, such as those made by the Planck Space Telescope, estimate the age of the universe at about 13.8 billion years, consistent with calculations based on the Hubble constant<sup>149</sup>, but with a greater degree of accuracy.

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<sup>149</sup> The age of the universe can be approximated using the Hubble constant. Observations indicate that the universe is constantly expanding after the inflationary phase, so the time since the Big Bang can be estimated to be the inverse of the Hubble constant.

The humanity of *the Logos* of God means the renewal of humanity and of the whole creation, in a new way of existence in the Church. In Christ Jesus, *the Logos* of the God incarnate, human persons are fully united with the source of existence, *the Logos*, in an active way that participates in the fullness of the body of Jesus Christ. Thus, humanity is defined theologically Orthodox as all people who have lived and will live in this universe, and who are called by the *Logos* to be part of the body of the Lord Jesus Christ, the Church. To understand Christ, you have to live with Christ and in Christ, liturgically, in the Eucharist. Orthodox theology is based on two inseparable manifestations of the Church's existence: Tradition and liturgical practical experience. It is precisely in liturgical reality that the Church lives full communion with Jesus Christ. The Liturgy and the Eucharist make the Church and her theology Orthodox, since, as long as the Eucharist exists, so does the Church (and vice versa).

The dialogue between Orthodox theology and science, focused on the *Christocentric* principle of creation and the anthropic principle in science, demonstrated a remarkable potential for convergence, highlighting profound compatibilities and synergies between these two seemingly disparate fields. In the course of this exploration, I have found that both principles offer complementary perspectives that, when integrated, can lead to a deeper and more holistic understanding of the universe and humanity's place in it.

a) *The Christocentrism of Creation in Orthodox Theology*

The *Christocentric* principle of creation, based on the patristic teachings and dogmas of the Orthodox Church, states that all things were created through and for Jesus Christ. This spiritual view of the universe sees creation not only as a set of physical processes, but as a manifestation of God's love and wisdom. In this context, every element of creation is integrated into a divine plan, and all things are united by Christ, who is *the Logos* of God incarnate. This vision provides a metaphysical and teleological basis for all creation, emphasizing that the universe is not a mere product of chance, but a manifestation of God's Reason. Every aspect of creation is seen as part of a unitary divine plan, in which all things are interconnected and find their ultimate meaning in Christ, *the Logos*, the Truth, the Reason of God, the Wisdom of God. This perspective offers an exhaustive vision of reality in its multiple physical and metaphysical dimensions, in which order, rationality, unity, meaning and purpose are essential and founded in the *Logos*.

*b) The anthropic principle in science*

From a scientific point of view, the anthropic principle emphasizes that certain physical constants and conditions of the universe denote a precision that tends to infinity, in order to allow the existence of rational human life that has consciousness. This principle, which can be formulated in weak and strong variants, shows that our existence is not an accident, but can be seen as a scope of a universe planned, so that human life may exist. This observation invites reflections on the profound nature of the reality of the universe and its contingency.

*c) Convergence and synergy*

By exploring these two principles, it has been highlighted that Orthodox theology and science can dialogue in a constructive and complementary way. *The Christocentric* creation provides a theological framework that can enrich the scientific understanding of the anthropic principle, emphasizing that the fine tuning of the constants of the universe can be interpreted as an indication of the *Christocentric* plan of creation. At the same time, the anthropic principle provides a set of empirical and observational data that support the deepening of theological reflection on *Christocentric* creation and divine providence, having *the Logos* as the source of the rationality and unity of the cosmos.

*d) Implications for Orthodox theology and science*

The integration of these perspectives not only reconciles the apparent disjunction between Orthodox theology and science, but also enriches both fields. Orthodox theology, by adopting an open dialogue with science, can find new ways of expressing as much as possible the mysteries of faith in a contemporary philosophical language, anchored in current cosmological realities, accessible to the present culture. On the other hand, science can benefit from the profound Orthodox theological experiences that provide existential meaning and context to empirical discoveries.

*e) The Development of the Elements to the Christocentric Scope*

The development of chemical elements, analyzed through the prism of theology and science, highlights the complexity and beauty of the natural processes that led to the formation of matter in the universe. Theologically, this process can be seen as the manifestation of the *Christocentric divine order and plan* in creation. Scientifically, the theories of stellar nucleosynthesis and the Big Bang provide detailed explanations of how the elements formed. The convergence of these perspectives emphasizes that the evolution of matter is not just a

mechanical process, but one that bears the imprint of a transcendental rational plane with an intentional purpose.

f) *The Reality of Creation and the Development of Life towards the Christocentric Goal*

The convergence of theology and science regarding the reality of creation and the development of biological life affirms that life is not an accidental product, but the result of a complex divine plan that has a precise purpose. Orthodox theology holds that all forms of life are created by God and carry within them a divine reason. Science, through genetic studies, shows that life has developed towards the anthropic scope through complex processes, based on contingent natural laws that have a transcendental origin. This convergence between theological teachings and scientific discoveries supports the claim that biological life, in all its forms, reflects both a natural physical process and a spiritual process, both of which originated in *the Logos* and are maintained by Him.

In this paper, I have explored the connections and synergy between the theological principle of *Christocentric creation* and *the anthropic principle* in science, emphasizing how these two perspectives can contribute to a unified and coherent understanding of reality. Our analysis has demonstrated that these principles are not only compatible, but mutually reinforcing, providing an integrated view of the universe and our place in it, highlighting the rationality and unity of creation.

*The Christocentric* creation provides a lens through which we can understand current scientific landmarks as reflections of the rationality and unity of creation. From the theory of relativity, the Big Bang, quantum mechanics, to *fine-tuning*, the present scientific paradigm offers us new ways to contemplate and appreciate the mystery of creation in the light of its purpose, Jesus Christ, *the Logos* of God incarnate. In this perspective, science and theology are not antagonists, but complementary disciplines that together reveal to us the richness and depth of the created universe.

Nothing in the positive knowledge of the world can disrupt or alter God's Eucharistic liturgical experience in this world. God, as spiritually revealed to us through practical experience *theology*, is not accessible by the means of science or by any other kind of understanding based on logic or perceptions based only on the physical universe.

The contemporary scientific paradigm is a topic of great interest. It is necessary *to note the modesty and honesty shown by physicists who admit that they offer us through their explanations only models of reality and not "what is" reality itself.* When Niels Bohr said that

*the purpose of science is not to know the essence of nature, but to discover what can be known about nature, he reminded us that science is a method of exploration, not the ultimate referee of facts and knowledge. Science is not an alternative to Orthodox theology. All apparent conflicts between science and Orthodox theology have their source in models of reality, and not in reality itself.*