



International Conference on Interdisciplinary Studies and Scientific Research

Hosted online from Cambridge, London

Date: 30th September, 2023

Website: <https://econferenceworld.org/index.php/ecw/index>

INNOVATIVE IDEAS AND GREAT DISCOVERIES OF ABU RAYKHAN BERUNI

SADULLAYEV SUKHROB A.

Tashkent Institute of Textile and Light Industry, Faculty of Printing
Technologies, student of 13-22 groups

Scientific supervisor: **GULARAM KAMILOVNA MASHARIPOVA**

Professor of the Tashkent Institute of Textile and Light Industry, Doctor of
Philosophy, Academician of the Turan Academy of Sciences

Abstract

The article scientifically substantiates the innovative ideas and great discoveries of the great encyclopedist Abu Rayhan Beruni. The natural scientific heritage of Abu Raikhan Beruni, the problems posed by specific sciences, play an important role in creating a general picture of the world, that is, in the formation of a philosophical worldview.

Keywords: discoveries, Scientific heritage, mineralogy, mineral stones, relics of ancient peoples, ontological, gnesological teachings.

By the beginning of the 11th century, the Karakhanids settled in the lands on the right bank of the Amu Darya. In Khorasan and Afghanistan, the rule of Mahmud Ghazni will strengthen. According to the agreement between the Karakhanids and Mahmud, the Amu Darya is recognized as the border between the two countries. As a result, Khorezm, located on the left bank of the Amu Darya, became part of



International Conference on Interdisciplinary Studies and Scientific Research

Hosted online from Cambridge, London

Date: 30th September, 2023

Website: <https://econferenceworld.org/index.php/ecw/index>

Mahmud's interests, and he quickly began to look for ways to annex Khorezm to his state. For this purpose, he gave one of his sisters in marriage to Khorezmshah Mamun. At first, Mahmud was on friendly terms with the Khorezmshah. But soon Mahmud began to challenge the Khorezmshah politically and demand his submission. The end of political oppression ends with the invasion of Mahmud's troops into Khorezm and the destruction of the country. Beruni, who was a direct participant in these events, was captured and, together with his teacher Abu Nasr ibn Iraq, was taken to Ghazna, the capital of the kingdom of Mahmud, in 1017 [1, p.114]. Thus begins the period of the scientist's life in the Treasury. Now he will leave politics forever and devote the next part of his life to science.

1. After the death of Sultan Mahmud in 1030, a new era began in the life of the scientist. Although Mahmud's youngest son Muhammad was declared crown prince, his eldest son Masud fought for the throne and overthrew his younger brother Muhammad, who had been sultan for a few months, and ascended the throne himself (1030-1041). After this, Beruni's life changed dramatically. Knowing that his father Mahmud did not like Beruni, Sultan Masud brought the scientist closer to himself and began to patronize him. Yakut Hamavi reported that good relations had developed between the scientist and the future Sultan. Beruni taught him the Arabic language, astronomy and other specific sciences [2, p.283].

2. A collection of 7 selected works by Beruni was published by the great Beruni scientist Ashraf Akhmedov in 2022 [3-9].

3. The great encyclopedist Abu Rayhan Beruni made a great contribution to the development of world civilization with many innovative ideas, concepts and theories.



E Conference World

International Conference on Interdisciplinary Studies and Scientific Research

Hosted online from Cambridge, London

Date: 30th September, 2023

Website: <https://econferenceworld.org/index.php/ecw/index>

4. At the age of 20-22, Beruni was the first in the East to make globes of the Earth and sky.

5. Abu Rayhan Beruni's innovative, intellectual philosophical idea for solving problems in the field of philosophical ontology of his time is that his concept of existence is based on the atomistic teaching of Democritus and developed by radically changing it. Beruni developed the ontological doctrine of Democritus, denying the existence of perceived emptiness [11].

6. Analyzing the geocentric theory of Ptolemy, Beruni put forward the idea that the Earth can revolve around the Sun in elliptical orbits, i.e. the main idea of his heliocentric system several centuries before Copernicus.

7. Beruni studied in detail the ancient history of Central Asia and wrote a very important work about it.

8. Beruni studied mineralogy in detail and wrote a work of great importance about it.

9. Beruni studied pharmacognosy in detail and wrote a very important work about it.

10. Beruni developed such subjects as ethnology and history, and wrote very important works on them.

11. Beruni studied the movement of bodies and came to the conclusion that it was necessary to deny the basic idea of Aristotle's ontology. According to the teachings of Aristotle, bodies have a "natural place" to which bodies strive, and having reached it, they stop moving and achieve rest. Beruni tried to deny the teleological component in Aristotle's ontological concept. To do this, Beruni provides fundamental critical arguments showing that Aristotle's teaching is contradictory and does not correspond to observed facts.



E Conference World

International Conference on Interdisciplinary Studies and Scientific Research

Hosted online from Cambridge, London

Date: 30th September, 2023

Website: <https://econferenceworld.org/index.php/ecw/index>

12. Beruni, based on a critical analysis of the teachings of Aristotle, comes close to proving the idea of the universality of motion and the idea of the plurality of universes, even if the stars and planets consist of the same material. atoms, and these atoms have been proven that even if they interact, attracting each other, these ideas will come true. These ideas of Beruni were similar to the idea of the plurality of worlds, discovered centuries later by Giordano Bruno, and to the modern cosmological theories of synergetics, global evolutionism and multiverses, discovered a thousand years later.

13. Beruni attached great importance to the following point: there is another universe, separated from our universe by a certain boundary and obstacle, and the direction of movement in this universe is directed in the opposite direction. Beruni's assumption is consistent with the theories of modern physics that antiworlds can exist.

14. Many centuries before Adam Smith, he said that labor is the basis of external economic relations and the monetary system.

15. Before Kepler, Beruni said that the orbits of the planets are ellipses.

16. According to Democritus, atoms move in space and are mechanically fastened to each other, in contrast to Beruni, who believed that forces of mutual attraction act between atoms. That is, Beruni put forward the basic idea of the theory of the gravitational field. The classical theory of the gravitational field was developed by the great scientist and thinker Isaac Newton, and later this theory was developed by the great scientist and thinker Albert Einstein in the general theory of relativity.

17. He revealed the main idea of the general theory of external fields, i.e. the idea that there are interaction forces between particles and bodies consisting of them,



E Conference World

International Conference on Interdisciplinary Studies and Scientific Research

Hosted online from Cambridge, London

Date: 30th September, 2023

Website: <https://econferenceworld.org/index.php/ecw/index>

and a field of forces that ensures this interaction. In turn, this teaching was further developed in theories such as the “Big Bang”, “black holes”, quantum gravity, geometrodynamics, supergravity, M-theory, which appeared on the basis of theories of the gravitational field and other fields.

18. The idea of the unity and diversity of fields and interaction through fields was developed in the 17th-20th centuries and is based on the modern physical landscape of the world and the modern scientific landscape of the world as a whole, and this idea appeared in Beruni’s ontology in the 11th century and is expressed in the form of the original idea [eleven].

19. Looking at the nature of light rays, Beruni believes that these rays consist of bodies, particles, i.e. the main idea of the corpuscular theory of light rays was put forward by Beruni, and after many centuries this idea was further developed by Newton, and then developed by Einstein in his theory of the photoelectric effect.

20. On the basis of modern physical theories of micro-, macro- and megaworlds, quantum mechanics developed in the works of such great scientists as Planck, Rutherford, Heisenberg, Schrödinger, Bohr, Pauli, Dirac and the theories of quantized fields. , identical in their principles, lie in a complex. These modern physical theories prove that rays are quanta of certain fields that provide certain types of interactions. These quanta have two types of particle-wave nature due to the fact that they have a quantum-field basis.

21. Beruni made a double contribution to the study of these fundamental processes: he put forward fundamental ideas concerning both the field aspect and the quantum-corpuscular aspect of these processes. It is worth noting that these ideas of his were expressed many centuries earlier than the ideas, concepts and theories created by the great scientists of modern science regarding the study of



E Conference World

International Conference on Interdisciplinary Studies and Scientific Research

Hosted online from Cambridge, London

Date: 30th September, 2023

Website: <https://econferenceworld.org/index.php/ecw/index>

these fundamental problems of science, the world scientific landscape and worldview.

22. Beruni took an innovative approach to the field of mathematics and created spherical trigonometry as a science with his teacher Ibn Iraq.

23. In the field of astronomy, Beruni determined the angle of deviation of the ecliptic to the equator, determined the change in this angle in time and created his own Zijs based on the Ziji of Khorezm.

24. Beruni made a great contribution to the development of geodesy as a science based on his creation of spherical trigonometry.

25. Beruni expressed the basic idea of historical geology and proved that geological phenomena are processes and changes.

26. Using the formulas of spherical trigonometry, Beruni made a great contribution to the development of geographical science, measured the radius of the Earth and the length of the equator with great accuracy and created a large globe.

27. Beruni predicted the existence of America as a continent inhabited by people before Christopher Columbus and Amerigo Vespucci, relying on the globe he created using the formulas of spherical trigonometry.

28. Beruni predicted the existence of the Antarctic continent many centuries before Thaddeus Bellingshausen and Mikhail Lazarev (1820).

29. By predicting that heat is associated with the movement of objects, Beruni expressed the basic idea of thermophysics and made a great contribution to its development.

30. Beruni described the history, achievements and spirituality of Indian civilization at a high level.



E Conference World

International Conference on Interdisciplinary Studies and Scientific Research

Hosted online from Cambridge, London

Date: 30th September, 2023

Website: <https://econferenceworld.org/index.php/ecw/index>

31. Beruni knew many languages from a young age, as his strong memory allowed him to learn languages quickly. In addition to his native Khorezmian-Turkish language, he was fluent in Arabic, Persian-Dari, Greek, Sanskrit, ancient Khorezmian, ancient Sugdian, and Hebrew languages and used their written sources¹. Because the city of Kot (Kat), where Beruni lived, was the capital of the Khorezm state and the crossing point of large caravan routes. In the caravanserai in this place there were many merchants from different countries of the world who spoke different languages. In communicating with them it was necessary to know merchant languages. Ziyarak Beruni loved to communicate with them from a young age.

32. The years 1010-1017 were the most significant years in the field of science for the scientists of the Mamun Academy, especially for Beruni. The last Khorezmshah Abu-l-Abbas Mamun ibn Mamun patronized the development of science and education. Such scientists as Abu Nasr ibn Iraq, Abu Ali ibn Sina, As-Saalibi, Ibn Miskawaih, Abu Sahl Mashihi, Abu-l-Khair Hammar worked at the academy. During this period, Beruni made many astronomical observations and wrote many books. Beruni made 14 astronomical observations in 1016.

33. From the mutual questions and answers of Beruni and Ibn Sina and their independent works, it is known that Beruni supported the substantial concept, while Ibn Sina supported the relational concept in interpreting the nature of space and time.

Conclusion

The philosophical views of Abu Rayhan Beruni study the national and religious views of the Central Asian region. In Beruni's philosophical views, along with



International Conference on Interdisciplinary Studies and Scientific Research

Hosted online from Cambridge, London

Date: 30th September, 2023

Website: <https://econferenceworld.org/index.php/ecw/index>

religious knowledge, his views on worldly natural science were confirmed in European science. Abu Rayhan Beruni saw the development of the country and the well-being of the nation inextricably linked with the development of science. Emphasizing the need for every scientist to be practical in his discussions, have a clear goal in his research, work tirelessly to find and correct errors, fight superficiality for the sake of truth, and combat superficiality of all kinds. fabrications, fights for life in a union in a country, fights for life in a union, nations are friends, friendly, strongly condemn wars that bring destruction to humanity, call people to peace. He also highly valued the practical application of experience and creative activity as observation in scientific knowledge.

Literature:

1. Nizami Aruzi Samarkandi. Collection of rarities or Four Conversations. Translation by S.I. Baevsky and Z.N. Vorozheikina. M., IVL, 1963, p. 114.
2. Belenitsky A.I. Essay on the life and works of Beruni. – Moscow, 1963. - P. 283.
3. Akhmedov A.A. Beruni and his work “Asor al-Bakiya” // Beruni Abu Raikhan. Selected Works Volume VII: Mathematical and Astronomical Treatises. Tashkent: NMIU “Uzbekistan”, 2022. P.5-36.
4. Akhmedov A.A. Beruni and his “Monuments of Past Generations” // Abu Raikhan Beruni. Monuments of past generations (Chronology). 2nd quest. Translation from Arabic M. Sales. Additions, corrections, preparation for chat, as well as an introductory article, comments and indicator by A. Akhmedov. - Tashkent: Publishing House “Fan”, 2015.- 664 p.



E Conference World

International Conference on Interdisciplinary Studies and Scientific Research

Hosted online from Cambridge, London

Date: 30th September, 2023

Website: <https://econferenceworld.org/index.php/ecw/index>

5. Akhmedov A. Contents of the work “Geodesy” and the scientific problems presented in it // Beruniy Abu Raikhan. Determination of address boundaries to determine distances (between) residential buildings (GEODESIA) // Selected works. Volume III.T.: NMIU “Uzbekistan”, 2022. P. 11-35.
6. Akhmedov A. Beruni and his work “Osor al-Bakiya” // Beruni Abu Raikhan. Monuments remaining from ancient peoples (Osor al-Bakiya) // Selected works Volume I. Tashkent: NMIU “Uzbekistan”, 2022.
7. Akhmedov A. Beruni and his work “Osor al-Bakiya” // Beruni Abu Raikhan. Monuments remaining from ancient peoples (Osor al-Bakiya) // Selected works Volume I. Tashkent: NMIU “Uzbekistan”, 2022.
8. Akhmedov A. Preface // Beruni Abu Raikhan. Mathematical and astronomical treatises // Selected works. Volume VII. Tashkent: NMIU “Uzbekistan”, 2022.
9. Akhmedov about the work of A. Beruni “Kanuni Masudi” // Beruni Abu Raikhan. Kanoni Masudi // Selected works IV 1-5 articles. T.: NMIU “Uzbekistan”, 2022. P.5-24.
10. Masharipova G.K. The influence of the natural science, socio-philosophical and spiritual heritage of scientists of the Khorezm Mamun Academy on the development of social thinking. Monograph. – Tashkent: Navro`z, 2019. – 158 p.
11. Masharipova G.K. Scientific heritage and philosophical views of Abu Raikhan Berunina. – Tashkent: Fan ziyoshi, 2022. – 160 p.