

THE SCIENTIFIC HERITAGE OF MIRZO ULUGBEK AND THE ROLE OF PUBLIC ADMINISTRATION IN THE CIVILIZATION OF THE EASTERN RENAISSANCE**Kurbanbaeva Munnavar**

Nukus branch of UzSWMI

Library Information Activity 2nd year student

Aitimova Dilbar

Scientific supervisor:

Nukus branch of UzSWMI

Associate Professor of the Department of Library Information Activities

Annotation

This article comprehensively analyzes the scientific and political activities of Mirzo Ulugbek, a prominent figure of the medieval Eastern Renaissance. The scientific significance of the scholar's research in the field of astronomy and mathematics, in particular, the activities of the Samarkand Observatory and the work "Zij-i-Jadid-i Kurangani," is revealed. It also highlights Ulugbek's enlightenment policy as a statesman and his contributions to the development of science and education. As a result of the research, it is substantiated that the activities of Mirzo Ulugbek were an important stage in the rise of Eastern scientific thought.

Keywords

Mirzo Ulugbek, Samarkand Observatory, Zij-i-Jadid Gurgani, astronomy, mathematics, trigonometric calculations, Eastern Renaissance, Timurid state, scientific school, Transoxiana.

The name of Mirzo Ulugbek, one of the brightest figures of the medieval Eastern Renaissance, occupies a special place in the history of world science. He was known as a prominent representative of the Timurid dynasty, a far-sighted statesman, and a deeply thoughtful encyclopedic scholar. In particular, his scientific heritage in the fields of astronomy and mathematics represents one of the important stages in the development of human civilization. Ulugbek's personality is considered one of the highest peaks of the scientific traditions of the East.

Mirzo Ulugbek's full name was Muhammad Taragay, son of Shahrukh, and the nickname "Ulugbek" was given to him by his grandfather Amir Timur. He was born on March 22, 1394, in the city of Sultaniya, one of the important residences of the Timurid state. Her father was Shahrukh Mirza, and her mother was Gavharshod Begum, an enlightened woman who held great influence in the Timurid court. Although young Muhammad Taraghai grew up in a palace environment, science, thinking, and spiritual maturity were prioritized in his upbringing. Historical sources indicate that Amir Timur paid special attention to his grandson's development into a knowledgeable and mature individual. Initially, Ulugbek was raised by his grandmother Saroymulkhonim and studied under the most prominent scholars of that time. The scientific school of scholars such as Qazizada Rumi, Ghiyasuddin Jamshid Kashi, and Mawlana Ahmad played a decisive role in its formation. As a result, Ulugbek mastered religious and secular sciences in harmony, perfectly mastered Arabic, Persian, Turkic and other languages, and grew up as a knowledgeable person who memorized the Quran in seven recitations. Physical education also played an important role in Ulugbek's personal development. From a young age, he regularly practiced horsemanship, archery, swordsmanship, and swimming. Such multifaceted training strengthened his will and further strengthened his memory and thinking potential.

Contemporaries especially note that he possessed exceptionally strong logical thinking abilities and was able to quickly and accurately solve complex problems. Mirzo Ulugbek's scientific talent was especially evident in the fields of mathematics and astronomy. He was one of the rare scientists who had the ability to perform complex trigonometric and algebraic calculations by heart. Ghiyasuddin Jamshid Kashi describes Ulugbek's calculating skills with admiration in his works. According to him, Ulugh Beg sometimes solved complex astronomical calculations accurately orally, without any writing. This situation shows that the mathematical thinking of the scholar was extremely developed. The most important stage of Ulugbek's scientific activity is connected with the famous observatory built in Samarkand. Built in the 15th century, this observatory was considered an extremely advanced scientific structure for its time. The construction of the observatory was organized not only as an architectural project, but also as a large research center based on a thorough scientific concept. The systematic observations conducted here brought Eastern astronomy to a new level. As a result of long-term observations conducted at the observatory, the duration of the solar year was determined to be 365 days 6 hours 10 minutes 8 seconds. Compared to modern astronomical calculations, this result shows extremely high accuracy. In achieving such accuracy, the trigonometric methods, observation methods, and computational techniques used by the Ulugbek school played an important role. From the point of view of modern science, these results are considered an unprecedented scientific achievement for medieval conditions.

The most important pearl of Mirzo Ulugbek's scientific heritage is the work "Ziji jadidi Kuragoniy," completed in 1445. This fundamental work is recognized as one of the most comprehensive star catalogs in the history of world astronomy. The work provides precise coordinates of 1018 stars, which served as the main guide for astronomers, sailors, and travelers for many centuries. The scientific value of this "Zij" lies in the fact that its observations are based on direct practical measurements and are performed with high accuracy. Other scientific works that have come down to us from Ulugbek also confirm that he was an encyclopedic scholar. In particular, "Treatise on Determining the Sine of One Degree" holds an important place in the history of trigonometric calculations. If "Risolayi Ulugbek" is devoted to astronomical issues, then the work "Tarixi arba' ulus" shows that his knowledge in the field of historiography was also deep.

Mirzo Ulugbek, as a statesman, was also one of the most progressive rulers of his time. He ruled Transoxiana from 1409 to 1449, elevating science and education to the level of state policy. On his initiative, large madrasas were built in Bukhara (1417), Samarkand (1420), and Gijduvan (1433). These educational institutions at that time became major scientific centers, where not only religious knowledge, but also mathematics, astronomy, logic, and philosophy were developed. The scientific school formed around Ulugbek is considered one of the largest scientific centers of the Eastern Renaissance. Famous scholars such as Qazizada Rumi, Jamshid Kashi, and Ali Kushchi worked in this school. As a result of their joint research, mathematical astronomy, trigonometric calculations, and observation methodology have reached a new level. The prestige of Samarkand's scientific environment even attracted the attention of European scientists.

During Ulugbek's reign, Maverannahr also developed significantly economically. Crafts, trade, and urban planning flourished. Industries such as paper production, textiles, and the production of colored glass flourished, and products were widely exported through the Great Silk Road. This shows that Ulugbek deeply considered economic factors in state governance. Importantly, sources emphasize that he was a just ruler. On certain days of the week, he personally received citizens, listened to their problems, and tried to solve them. The fact that he allocated a large amount of funds to financially support scientists and students clearly demonstrates his attention to science.

In conclusion, Mirzo Ulugbek is one of the unique historical figures who managed to combine science and state administration. The scientific school he created, the astronomical

tables he compiled, and the enlightenment policy he pursued played an important role in the development of world civilization. The scientific heritage of the great scientist has retained its relevance to this day and serves as one of the important historical foundations in the formation of modern astronomy and mathematics. Ulugbek's life and work are of particular importance as a school of invaluable historical experience, leading the younger generation towards science and enlightenment.

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