About the Great Uzbek Astronomer and Mathematician, Statesman Mirzo Ulugbek

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A B S T R A C T

This article is about the great Uzbek statesman, astronomer and mathematician. Ulugbek is known to the world as an astronomer with his work "Ziji Koragoniy". Also, the value of Pi is calculated with an accuracy of up to 17 cells, i.e.

π = 3, 1415926558927932

Ulugbek (official title Muhammad Taragai) was a brilliant Uzbek astronomer and mathematician, as well as a statesman, who was born on March 22, 1394 in Sultania during Timur's military campaign in modern-day Iran. Ulugbek, Timur's grandson, was one of the scientists who, during the middle Ages, brought Central Asian science and culture to the forefront of world science.

During his grandfather Timur's great military expeditions, Ulugbek grew up in the background of the establishment of a strong feudal state headquartered in Movarounnahr. Timur frequently accompanied Ulugbek on these campaigns, paying close attention to his upbringing. Ulugbek was educated by skilled and experienced professors and was literate, as well as having been exposed to the fundamentals of religion and secular sciences.

Ulugbek spoke Arabic and Persian fluently.

After Timur's death in 1405, the Timurids began a power struggle, and political differences grew. In 1409, two independent republics emerged as a result of this struggle: Khorasan and Movarounnahr. Ulugbek, who was 15 years old at the time, ruled over Shahrukh, Herat's capital, and Movarounnahr, Samarkand's capital. Ulugbek did not invade in the same way that his grandfather Timur did.

Ulugbek has a rich scientific and cultural legacy that has contributed significantly to the advancement of global science and culture. The astronomical table "Ulugbek Zidzhi" is one of them. The tables are based on observations made at the Zij-based Ulugbek Observatory. Muqaddimah was translated from Persian to Arabic when the theoretical half of the work, Muqaddimah, was introduced. the Arabic text differs slightly from the Dari version, as the theoretical basis of the work was written before the collection of observational material.

Ulugbek is known to the world as an astronomer with his work "Ziji Koragoniy".

In his time, many works were translated from Arabic and Persian into ancient Uzbek. The rich library founded by Ulugbek contained more than 15,000 volumes of books on various subjects.

Ulugbek was familiar with the classics of Greek scientists such as Plato, Aristotle, Hipparchus, Ptolemy, studied the works of his compatriots Ahmad Ferghani, Beruni, Ibn Sino, Khorezmi. Ulugbek Madrasah in Samarkand in 1420 was not only a university, but also an academy of that time, along with an

observatory. A well-known scientist of his time, Ulugbek's teacher, mathematician and astronomer Kazizoda Rumi was one of the teachers of the madrasah. Ali Kushchi is one of Ulugbek's students who helped him in his scientific work.

According to the historian Davlatshah, "Ulugbek was like Euclid in geometry and Ptolemy in astronomy."

At the Ulugbek Academy, Giyosiddin Kashi created the arithmetic of decimal fractions (although it was rediscovered in Europe 150 years later) (although it was rediscovered in Europe 150 years later). Ulugbek and Kashi devised a method for calculating the sine of a one-degree arc (by solving a tertiary algebraic problem of the type $(ax^3 + bx + c = 0)$. Also, the value of the Cauchy Pi number is calculated with an accuracy of up to 17 cells, i.e.

π = 3, 1415926558927932

Astronomers led by Ulugbek carried out important scientific work and built an observatory with relatively accurate equipment for a deeper study of the mysteries of the universe. Ulugbek for the first time with great accuracy determined the width of Samarkand at the observatory and calculated the value

$\varphi = 39°37′ 33″$. The study of this value showed that it is $\varphi = 39° 40′ 37″ \pm 1″$ 0. Despite the lack of modern observational and measuring instruments, Ulugbek correctly calculated the movement of the Sun and the Moon, and his calculations differed little from current calculations. This can be seen by comparing Ulugbek's calculations with the predictions of astronomers at different times to determine the inclination of the ecliptic plane (a great circle formed by the annual movement of the Sun) to the equator:

Eratosthenes $23°51′20″$ made a mistake on $+ 7′35″$

Hipparchus $23°51′20″$ made a mistake on $+ 8′23″$

Plotemey $23°51′20″$ made a mistake on $+ 10′10″$

Buttony $23°35′$ made a mistake on $- 0′17″$

Abdulvafo $23°35′$ made a mistake on $+ 0′35″$

Koshy $23°51′01″$ made a mistake on $+ 16′36″$

Tusiy $23°30′$ made a mistake on $- 2′9″$

Ulugbuk $23°30′17″$ made a mistake on $- 0′32″$

Ulugbek's calculations regarding the year of the star are also very close to the current calculations:

Ulugbek 365 days 6 hours 10 minutes 8 seconds

Actually 365 days 6 hours 9 minutes 6 seconds

Ziji Koragoniy entered the European cultural world shortly after the death of Ulugbek. In particular, in 1643 Oxford University published a copy of the work of J. Graves (17th century). In Poland in 1690, the astronomer Jan Hevelei (1611 - 1687) published in Latin the "Atlas of the Starry Sky", this is a huge achievement in the work of Ulugbek. The scientific heritage of Ulugbek was also studied by the English orientalist T. Hyde, the French astronomers J. Delambre (1749 - 1822), L. Sedio (19th century), the German astronomer K. Peters (1806 - 1880), and later the German orientalist K. Brokelman (1868) - 1956) and other major European scientists, and also published "Zij" in different languages and in different cities of Europe and America.

Many scientists from Turkey, Iran, Afghanistan, India and European countries have used Ulugbek's research methods to build observatories like his.

V.V. Bartold was one of the first to study the scientific and cultural heritage of Ulugbek in Russia. In 1908, archaeologist V.L. Vyatkin discovered the ruins of the Ulugbek observatory.

In Soviet times, interest in studying the scientific and cultural activities of Ulugbek grew. T. N. Kori-Niyazi Ulugbek perfectly revealed the details of Ziji. His monograph Ulugbek's Astronomical School (Moscow, 1950) was awarded the USSR State Prize.

Our Samarkand State Institute of Architecture and Construction is named after Mirzo Ulugbek. Currently, talented students of our institute demonstrate their knowledge and receive grants not only in our republic, but also in Russia and Kazakhstan. We are proud to be the successors of Mirzo Ulugbek and prove that we are his followers.

References:

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2. History of Uzbekistan. Tashkent, 1988