THE SIGNIFICANCE OF ASTRONOMY IN ISLAM

"We have not created the heaven and the earth and all that is between them in mere idle play. None of this have We created without an inner truth: but most of them understand it not. " (Qur'an-Dukhan 44:38-39)

"...He created the sun, the moon, and the stars (all) governed by laws under His commandment." (Qur'an-A'raf 7:54)

It is truly remarkable that the Quran revealed between 610 and 632 CE contains in it scientific knowledge that has taken centuries to be discovered. The only explanation for this is that without a doubt, it is divine in origin. Muslims believe that the wordings of the Quran are the actual word of Allah, the Most High.

If there is any religion that invites man to the study and understanding of the worlds, it is Islam. An understanding of the discipline of astronomy is essential for the appreciation of the religion of Islam. No other religion uses or relies on the nature and the motional characteristics of the moon and sun for time keeping and calendars as Islam does. This tremendous universe that we live in is created by God and all human beings are invited to reflect upon it, to understand it so that all may be able to practice the only one Abrahamian religion of unity with conviction based on reason to the best of our abilities.

"And it is He who ordained the stars for you that you may be guided thereby in the darkness of the land and the sea." (Qur'an-An'am-97)

If you become familiar with the constellations and the stars in the sky, one can never be lost anywhere in the world. They are truly a guiding light in the canopy of the heavens. You can be anywhere in the world and immediately on looking up in the night sky and by recognizing stars; you can know what latitude you are at and where are north and thereby all the other directions. You can know what time of the year it is in the absence of any calendars. It is rather appropriate that the crescent moon and star is used as signs to represent matters of religion among Muslims.

The moon and the sun are of vital importance in the daily life of every Muslim. Using the moon, Muslims determine the beginning and the end of the months in their lunar calendar. By the sun the Muslims calculate the times for prayer and fasting based on the position of the sun in the horizon. It is also by means of astronomy that Muslims can determine the precise direction of the Kiblah, to face the Kabah in Makkah, during prayer.

"They ask you about new crescent moons, say they are but signs to mark fixed period of times for mankind and Hajj..." (Baghara 2:189)

The subject of crescent visibility has been studied in modern times by Prof Elias from Malaysia who has developed several visibility criteria and the concept of the International Lunar Date Line (ILDL). Elias’s main criterion depends on the moon's altitude (in degrees) above the horizon at sunset and the moon's angular distance from the sun (relative azimuth) at sunset. If a moon's altitude and relative azimuth are greater
than certain threshold values, then the moon is likely to be visible. The ILDL is a curved line on a world map which separates areas (west of the line) where the crescent is likely to be seen at the start of the lunar month from areas (east of the line) where the crescent is unlikely to be seen. The probability of sighting the crescent increases as one travels west of the ILDL and diminishes as one travels east of the ILDL. Unlike the solar date line which has a fixed position, the position of the ILDL moves from month to month.

EXPANSION OF THE UNIVERSE

"WE constructed the (sky) firmament with power and skill and verily WE are expanding it." (Zaariyaat 51:47)
The ideas have emerged from over two thousand years of observation have had to be radically revised. In less than a hundred years, we have found a new way to think of ourselves. From sitting at the center of the Universe, we now find ourselves orbiting around an average-sized sun, which is just one of millions of stars in our own Milky Way galaxy. And our galaxy itself is just one of billions of galaxies, in a Universe that is limitless and expanding. This was discovered in 1926 by Edwin Hubble. But this is far from the end of a long history of inquiry. Huge questions remain to be answered, before we can hope to have a complete picture of the Universe we live in. The expansion of the Universe is one of the most imposing discoveries of modern science. Today it is a firmly established concept and the only debate centers around the way this is taking place.

The expansion was first suggested by the General Theory of Relativity and is backed up by physics in the examination of the galactic spectrum. The regular movement towards the red section of the spectrum may be explained by the distancing of one galaxy from another. Thus the size of the Universe is probably constantly increasing and this increase will become bigger the further away the galaxies are from us. The speeds at which these celestial bodies are moving may, in the course of this perpetual expansion, go from fractions of the speed of light to speeds faster than this. Besides indicating that the Universe is expanding much faster than in the past, the chance discovery of the most distant supernova has revived a discarded theory of Albert Einstein suggesting the pervasive existence of mysterious "dark energy".

Astronomers using the Hubble Space Telescope found the exploding star about 10 billion light-years from Earth. The discovery bolsters the startling notion that the Universe has recently begun speeding up its expansion, which scientists first speculated three years ago based on the unusually dim light from other distant supernovas. "It shows that the expanding of the Universe is really speeding up and not slowing down as conventional astronomers had thought for 70 years," said University of Chicago astronomer Michael Turner. The new stellar explosion has helped astronomers understand how the Universe expands, "much the same way a parent follows a child's growth spurts by marking a doorway," said Hubble scientist Adam Riess, lead researcher in the new study. The Universe slowed down its expansion for a time and then began a period of accelerated growth, Riess said.
THE BIG BANG THEORY

"... Do the unbelievers not realize that the heavens and the earth used to be one solid mass that we exploded into existence? And from water we made all living things. Would they believe?"
(Anbiyaa 21:30)

Now if all these galaxies are moving away from each other, where did they come from? In 1927, the Belgian priest Georges Lemaitre was the first to propose that the Universe began with the explosion of a primeval atom. His proposal came after observing the red shift in distant nebulas by astronomers to a model of the Universe based on relativity. Years later, Edwin Hubble found experimental evidence to help justify his theory. He found that distant galaxies in every direction are going away from us with speeds proportional to their distance.

The theory of Big Bang states that the Universe came into being as an extremely small volume full of energy which gave the Universe a very high temperature. As the Universe expanded so the fundamental atomic particles were formed as a mixture dominated by hydrogen with some helium and almost nothing else. According to the big bang, the Universe was created sometime between 10 billion and 20 billion years ago from a cosmic explosion that hurled matter and in all directions.

THE SPINNING OF THE EARTH

"He (God) coils the night onto the day and coils the day onto the night." (Zumar 39:5)

The use of the word "coils" was once thought to be a purely poetic one, but today's astronomical Arabic word knowledge confirms that the word "coils" is scientifically very accurate in describing the spinning movement of the earth.

REVOLVING MOTIONS OF UNIVERSES

"And made the moon a light in their midst and made the sun as a (Glorious) lamp." (Morsalaat 77:16)

At the time of revelation of the Quran, it was a commonly held belief that the earth stood still and that the sun orbited around us. After all it seemed logical. Man's ego was bigger than the universe or so he thought. It was easier to believe that he lived in the centre of the Universe. It was not until 1543, that the Astronomer Nicolaus Copernicus publishes De Revolutionibus, in which he states that the earth and the other planets revolve around the sun. Just pause and look at the time interval when that piece of information was in the Holy Quran.

Hostility to science generally and astronomy particularly was the misfortune of the Catholic Church in the early 16th and 17th century. In 1633 Galileo was forced to kneel in front of the Inquisition and recant his belief in the Copernican planetary system. He was condemned to life imprisonment, ostensibly for having disobeyed "...not to defend or teach the Copernican doctrine..."
ROVOLVING MOTIONS OF ALL GALAXIES

"Consider those (stars) that rise only to set and move (in their orbits) with steady motion. They float (through space) with floating serene. And yet overtake (one another) with swift overtaking. And thus fulfill the (Creator's) behest!" (Nazeaat 79:1-5)

The stars do move in an orbit and with steady motion too as they float through space. They do overtake one another because in any spiral structure that is rotating; the outer arms will move at a faster rate than the inner sections and will thereby overtake the stars on the interior in their motion. The spiral nature of our galaxy was only discovered in this century since its spiral nature is not easily evident to us as we reside inside.

There is order, cosmos…not chaos in this tremendous universe. The moon and earth float in orbits and they are predictable in their behavior. It has been shown that if one planet was removed from our system, our solar system is no longer stable. Comets are predictable and they return as expected bound by the laws of Physics, God's laws. Man can never truly invent, he can only discover. The Universe is predictable in its behavior because Allah has subjugated its constituents and they obey him scrupulously, unlike man who has been granted will.

THE ELEVEN PLANETS

"O my father! Lo! I saw in a dream eleven planets and the sun and the moon, I saw them prostrating themselves unto me." (Yussef 12:4)

The aforementioned Verse is the statement of the Prophet Yussef to his father reporting his vision in his dream. Consisting of the Sun, a family of nine known planets, sixty seven (67) satellites (moons) of the planets, millions of asteroids, and billions of comets, our Solar System is an oasis of light, heat, and life. The inner solar system contains the Sun, Mercury, Venus, Earth and Mars. The planets of the outer solar system are Jupiter, Saturn, Uranus, Neptune, and Pluto.

What about the Tenth Planet and Eleventh Planet? Astronomers may have found hints of a massive, distant, still unseen object at the edge of the solar system - perhaps a 10th planet, perhaps a failed companion star - that appears to be shoving comets toward the inner solar system. Two teams of scientists, one in England, and the other one at University of Louisiana at Lafayette, independently report this conclusion based on the highly elliptical orbits of so-called "long-period comets" that originate from an icy cloud of debris far, far beyond Pluto. As the planet - estimated to have a mass between one and 10 Jupiter's - orbits, its gravitational wake disturbs the icy debris of the outer solar system, causing some of it to plunge toward the sun as comets. No one has yet directly observed a 10th planet, and there could still be another cause for the cluster of comets.

What's surprising is just how far out there this supposed planet is. Both Murray and the University of Louisiana physicists put the planet in an orbit about 3 trillion miles - or half a light-year - from the sun. The nearest star is four lights-years away. To put this distance in perspective, consider a miniaturized version of the solar system in which
Earth is one inch from the sun. On this scale, Pluto, the ninth planet would be a bit more than a yard from the sun. The new planet, by contrast, would be a half-mile distant. At that great distance, the 10th planet would be too dim to see by current telescopes, although there is some hope that if it exists, the next generation of space-based infrared telescopes might be able to pick it up soon. As for the 11th planet, next generations will probably have the chance to discover it as well, as the Quran predicts it. And God knows best.

The above materials were abbreviated and edited from http://www.salaam.co.uk