



# SCIENCE & SPIRITUAL QUEST

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आ नौ भद्राः कर्तवो यन्तु विश्वतोऽर्दब्धासो अर्परीतास उद्भिर्दः । (RgVeda) *Let noble thoughts come to us from every side*

## Science-Spirituality Dialogue 'Earth Can't Be the Only Planet With Life'



A Discussion between  
**Dr. Robert Mah** (left), NASA  
and  
**Dr. T. D. Singh** (right),  
Physical Organic Chemist,  
Founding-Director of  
Bhaktivedanta Institute

**T. D. Singh (Henceforth TDS):** One of the things that I am interested in is the exploration of the outer space. According to our *Puranic* or ancient Vedic culture there are living beings on other planets and in other universes. This idea is strongly supported in our scriptures. So after these missions, we have tremendous interest in finding if this is true or not (laugh). What is your impression on this?

**Dr. Robert Mah (henceforth RM):** This Mars mission is still within our solar system. If there is life, that is going to be found out.

**TDS:** What about life being beyond the solar system, on other planets in other universes?

**RM:** That's what I believe. We're discovering planets now. Before people thought planets were not there but now they see that planets are there. They should be able to sustain life. When you see how abundant life is here on Earth, then when you look up in the sky, you think that there has to be life over there too. This Earth can't be the only planet with life. But then as we were talking yesterday, where is the end to that universe? Then there's the universe in everybody's mind too.

**TDS:** According to our ancient literature, there are many types of universes. Some are small universes like ours; this is the smallest universe. And beyond, there are many other universes with living beings. This has actually been recorded. Do you believe in that?

**RM:** We were talking about theories. As they were saying last night, theories always change and it just depends on how strongly they are supported. The Big Bang, for instance, was thought to be the beginning, but now it's considered

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*"To attain happiness ... one must use all one's efforts  
to expand more and more one's knowledge of  
God and His works.*

— Leonhard Euler  
Mathematician

To Know about Life, Matter, and their Interactions is called Knowledge

differently. From Stephen Hawkins's theory, there is existence before the Big Bang.

**TDS:** Material concepts may be true or may not be true, depending on how we are finding that knowledge. But there is another aspect of the truth - the Absolute Truth. Once we seek out the truth, we have to find out the truth. There are many scientific conceptions about life on other planets, it is very interesting. Now we live on this earthly planet, therefore our bodies are made of earthly elements. The other planets may not be of the same type of 'matter' that we get here on this earth. The sun globe is mostly heat for example. In the heavenly systems, the components are different. Accordingly, bodies will be different.

**RM:** So there could be some gaseous phase or something like that. I think the density, the shape or the forces that are here will be different elsewhere.

**TDS:** Modern science has developed mostly to research physical knowledge. That is not the only aspect of reality.

[Excerpt from the book, *Tattvajijnāsā* Vol-2 — Magazine of the Bhaktivedanta Institute, Kolkata]

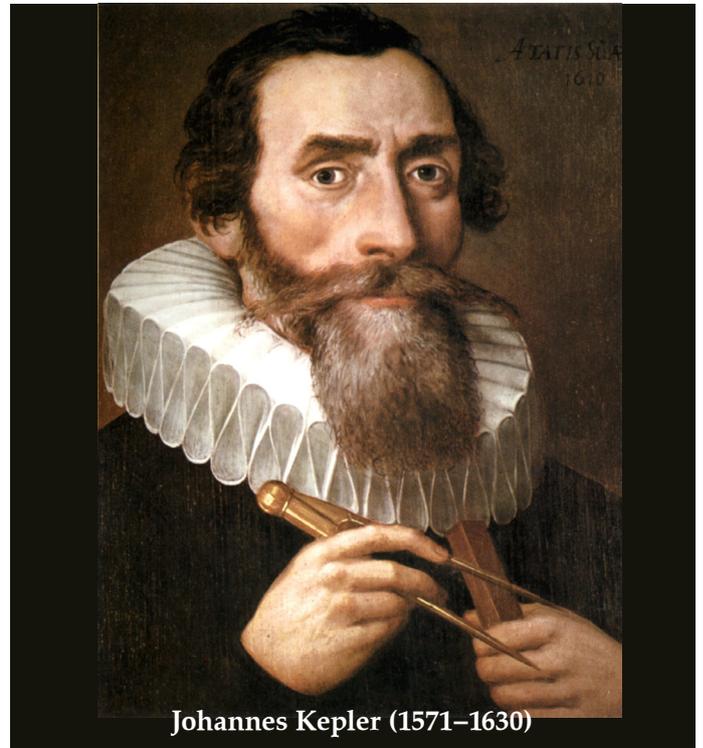
### On the Shoulder of Giants

## Johannes Kepler A Man of Science and Religion

Johannes Kepler is one of the most influential mathematicians and astronomer of the 16th century. He is widely regarded as the founder of modern astronomy for his discovery of the laws of planetary motion. His work on celestial mechanics served as an important contribution in developing the foundation of general mechanics created by Isaac Newton. He made significant contributions in other fields such as mathematics (in the geometry of solids and logarithms), meteorology, and astrology.

Johannes Kepler was born to a poor family in Weil der Stadt, Germany, on December 27, 1571. As a child, Kepler contracted smallpox when he was four. The disease left him with deficient eyesight (multiple visions and nearsightedness) and a general weakness that handicapped him for the rest of his life. He found solace from these physical ailments and his unhappy home life in religion and books. Kepler's first dramatic encounter with the wonders of the night sky was at the age of six when his mother took him to the hillside to view a comet. This childhood amusement evolved into a lifelong dedication to astronomy.

In 1591, Kepler completed his two-year advanced study in the arts and received a master's degree from the University of Tübingen and continued further to study in the theological faculty to become a clergyman. During the last two years of the seminary in Tubingen, Kepler emerged as a gifted mathematician. On the behest of his astronomy professor, Michael Maestlin, Kepler accepted the teaching post in mathematics in Graz, Austria. At Graz, Kepler was keen to explore the connection between philosophy and astronomy in a systematic manner. Because of his poor eyesight, he could never trust his own observations and became more interested in the why and how of the astronomical observations such as planets' paths, their varying distance from the sun, and their



Johannes Kepler (1571–1630)

varying speed. He believed that the secret key to the universe lies in—the number, dimensions, and motions of the planets.

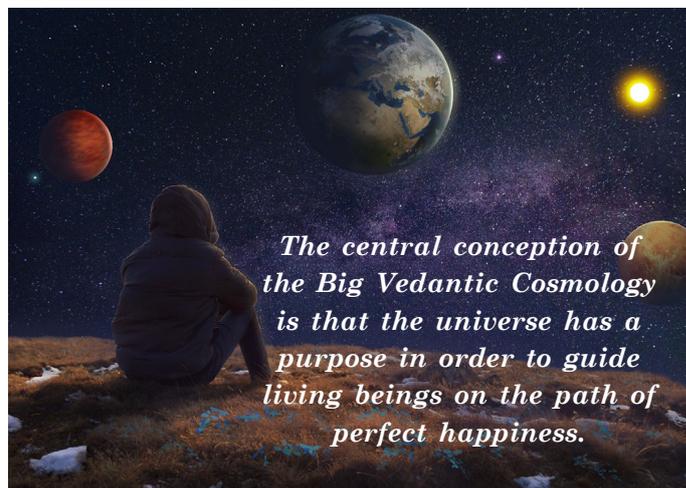
Kepler's initial vision of the universe rested upon his studies of symmetrical, three-dimensional objects known as Platonic solids. This theory was published in his treatise *Mysterium cosmographicum* (The Sacred Mystery of the Cosmos, 1596). Although the principal idea was erroneous, Kepler established himself as the first scientist to demand physical explanations for celestial phenomena. His fundamental belief in the mathematical harmonies underlying the workings of the universe guided him in explaining the celestial motions. In 1609, he published *Astronomia Nova* (New Astronomy), in which he described his theories on planetary orbits, which are now called Kepler's first two laws of planetary motion. Despite poor eyesight, Kepler was one of the pioneers of research into optics and published *Dioptrice* (1611), which also contains an account of a new astronomical telescope with two convex lenses. For the first time, the principle of photo measurement was introduced in his treatise on optics titled, 'A Supplement to Vitellio'.

Throughout his life, Kepler attributed his scientific ideas and motivation to his quest for understanding the mind of God. On completing the periodic times of the planets, Kepler exclaimed, "Oh God, I am thinking Thy thoughts after Thee." His insight into the motions of the planet served to discover the plan of creation and finally to glorify the creator. In his book *Harmonice Mundi* (1618), Kepler established his grand cosmic vision that involved music, geometry, astronomy, and astrology. Kepler's life and work provide central evidence that science and scientific exploration into the working of the physical world enhance the understanding of the greatness of God the Creator. Kepler writes the following in a letter to his teacher, Michael Maestlin, "I wanted to become a theologian. For a long time, I was restless. Now, however, behold how through my effort, God is being celebrated in astronomy." On the occasion of Kepler's 300<sup>th</sup> death anniversary, the craters on the Moon and Mars and a mountain on Phobos was named after him to honor his incredible work in cosmology.

## The Purpose of the Cosmic Creation – A Vedantic Perspective

Happiness is the ultimate goal of every living being. Cosmic creation must, therefore, have a built-in potential principle on how every living being can attain real happiness. The central conception of the Vedantic Cosmology is that the universe has a purpose in order to guide living beings on the path of perfect happiness. Fascinated by unique and inconceivable properties in the cosmic world such as the orderly laws of nature (intelligent design), and the unique values of the physical constants of the universe, many prominent scientists and scholars feel that there might be some purpose for the universe. Roger Penrose says, "I would say the universe has a purpose. It's not there somehow by chance." Professor George Wald, Nobel Laureate in Biology says, "The great disparity in mass between nucleons and the electrons is one of the necessary conditions for life. Almost the entire mass of an atom is in the nucleus and it is thought to maintain its position regardless of how the electrons are moving about it. That is the only reason why anything in the universe stays put. If the protons and neutrons were close in mass to the electrons – whether light or heavy they would rotate around one another (about their common center of mass). All the matter in the universe would be fluid." Charles Townes, a Nobel Laureate in Physics, says that there are unique physical constants of our universe. If the value of these physical constants had been slightly different the universe would have been very different. That makes many think that our universe is very special and has a purpose.

According to Vedanta, the purpose behind the manifestation of material world is to bring the deluded living entities back to the real platform of happiness by awakening *bhakti*, the devotional yoga within every one. *Bhakti* is the sublime devotional quality which connects the individual with the Supreme Spirit – God with utmost humility and unalloyed service. By misuse of free will, living beings in the cosmos want to take the role of the Supreme Master and enjoy unlimitedly by trying to fulfill the unending demands of the mind and the senses. When a serious



person has understood his false position and has experienced that he cannot have real happiness materially he begins to inquire, "where can I get real happiness?" He then turns to the Supreme Lord for help. This quest for understanding the deeper meaning of life is the turning point in the life of individuals.

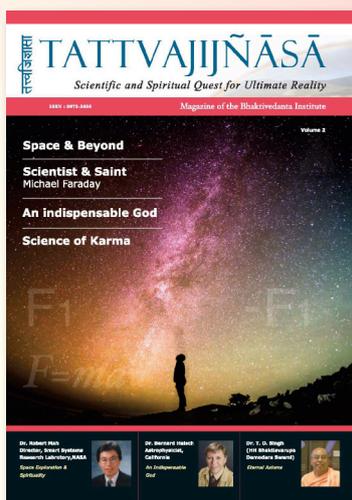
*Vedāntasūtra* (VS 1.1.1) describes the most important path for searching the meaning of life and absolute truth. By sincere inquiry, the intelligent person will come to the right path and regain his or her original consciousness and eternal happiness. In other words, the cosmic manifestation takes place by the arrangement of the Supreme Lord in order to give an opportunity for serious human beings to transform themselves from material to spiritual consciousness. Thus Vedantic cosmology is based on the grand Big Vision of the Supreme Lord in order to give ultimate happiness to all living beings. Thus it gives the answer to the question, "Why is the universe created?" Vedanta, therefore, explains the theistic cosmology. In the *Bhagavadgītā* (Bg. 9.10) Lord Śrī Kṛṣṇa, the Supreme Lord says that He is the source of everything.

A careful study of cosmology provides the foundation for the natural relationship between God and the individual living being, between man and other forms of life and man and the environment. Such a foundation is the essence of global ethics.

[Excerpt from the book, *Vedanta and Science Series: Life and Origin of the Universe*, Bhaktivedanta Institute, Kolkata, 2005.]

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