



INDIAN TRADITIONAL KNOWLEDGE

III B.Tech V Semester

Department of IT

8-Astronomy and Astrology

Unit-3

Lecture-1

India I found a race of mortals living upon the Earth, but not adhering to fixed cities, but not being fixed to them, possessing everything they needed by nothing.

- Apollonius Tyanaeus, Greek Thinker and Traveller, 1st century A.D.

The temple of **Konark** was dedicated to **Surya-the Sun God** Surya was mentioned in Vedic literature.

Astronomy

In India the first references to astronomy are to be **found in the Rig Veda**, dated around **2000 B.C.**

The Vedic Aryans in fact deified (treat as God) the Sun, stars and comets.

Astronomy was then interwoven with astrology.

The Aryans have involved the planets (called **Grahas**) with the determination of human fortunes.

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planets **Shani, i.e. Saturn and Mangal, i.e. Mars** were considered **auspicious**.

In the working out of horoscopes (called Janmakundli), the position of **Navagrahas, nine planets plus Rahu and Ketu** (mythical demons, evil planets) is considered.

Janmakundali was a complex mixture of **science and dogma** (established tradition). But the concept was born out of astronomical observations and is a concept based on astronomical phenomenon.

In ancient times personalities like **Aryabhatta and Varahamihira** are associated with **Indian astronomy**.

Astronomy had advanced to such an extent in ancient India that ancient astronomers had recognised that stars are same as the sun, that the Earth is the center of the universe (solar system).

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Ancient Indians also stated that the **circumference of the Earth is 72,000 yojanas**. One **yojana being 7.2 kms**, the ancient Indian estimates came close to the actual figure.

Calculation of Eclipses and the Earth's Circumference

In Indian languages, the science of astronomy is today called **Khagola Shastra**.

The word **Khagola** perhaps is **derived from** the famous astronomical observatory at the **University of Nalanda**, which was called **Khagola**.

It was at Khagola that the famous 5th century Indian astronomer Aryabhata lived and extended the subject.

Varanasi or **Kashi** is one site where the **Kumbha Mela** is held. The dates of Kumbha are derived from solar calculations and are **declared 12 years once**.

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Aryabhata is said to have been **born in 476 A.D.** at a **town called Ashmaka** in an state of **Kerala**.

When he was still a young boy he had been sent to the University of Nalanda to study astronomy. He made significant contributions to the field of astronomy.

He also **propounded the heliocentric theory of gravitation**, thus **pre-empting Copernicus by almost one thousand years**.

Aryabhata's **Magnum Opus, the Aryabhattiya** was translated into Latin in the 17th century.

Through this translation, **European mathematicians got to know methods of calculating the areas of triangles, volumes of spheres as well as square and cube roots.**

Aryabhata's ideas about **eclipses** and the **sun being the source of moonlight** not only caused much of an impression on European astronomers as they know it today but also through the observations of Copernicus and Galileo.

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considering that **Aryabhata discovered these facts** 1500 years ago, **1000 years before Copernicus and Galileo** makes him a pioneer in this area. Aryabhata's methods of astronomical calculations given in his *Aryabhatiya* were reliable for practical purposes of fixing the **Panchanga** (calendar).

Due to lack of a telescope hindered advancement of ancient Indian astronomy. With their unaided observations, with crude instruments, the astronomers of ancient India were able to arrive at near perfect measurement of astronomical movements and predict eclipses.

Indian astronomers also propounded the theory that the **Earth was a sphere**. Aryabhata was the first one to have propounded this theory in the **5th century**. Another Indian astronomer, **Brahmagupta estimated in the 7th century** that the **circumference of the earth was 5000 yojanas**.

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ojana is around **7.2 kms**. Calculating on this basis we see that the es **36,000 kms** as the **earth's circumference** comes quite close to the umference known today.

eliocentric Theory of Gravitation (SUN centric solar system)

re is an old Sanskrit sloka (couplet), which is as follows:

Sarva Dishanaam, Suryaha, Suryaha, Suryaha."

s couplet, which describes the night sky as full of suns, indicates t
ient times Indian astronomers had arrived at the important discove
stars visible at night are similar to the sun visible during day time.

was recognised that the sun is also a star, though the nearest one
nderstanding is demonstrated in another sloka, which says that when o
ks below the horizon, a thousand suns take its place.

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Brahmagupta in the 7th century had said **about gravity**, "Bodies fall towards the Earth because it is in the **nature of the Earth to attract bodies**, just as it is in the nature of a magnet to attract iron." **How.**"

But a **hundred years before Brahmagupta**, another astronomer, **Varahamihir** had **imagined** for the first time perhaps that there should be a **force which might be keeping bodies stuck to the Earth**, and also keeping heavenly bodies in their **fixed** places.

It was also recognised that this force is a tractive force. The **Sanskrit term for this force is Anuraktakarshan**, which is an amalgam of **Guru-tva-akarshan**.

Anuraktakarshan means to be attracted.

The **sun** was recognised by all ancient people to be the source of light and warmth.

The **Sun (Surya)** was one of the chief deities in the Vedas. He was recognised as the **source of light (Dinkara)**, **source of warmth (Bhaskara)**.

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**he Vedas Sun is also referred to as the source of all life, the centre of c
the centre of the spheres.**

idea that the sun was looked upon as the power that attracts heavenly bo
ported by the virile terms(male) like Raghupati and Aditya used in referring

le the **male gender** is applied to **refer to the Sun**, the **Earth (Prithivi, B
) is generally referred to as a female.**

term Gurutvakarshan also supports the recognition of the heliocentric the
term Guru corresponds with the male gender, hence it could not have refe
Earth, which was always referred to as a female.

ny ancient Indian astronomers have also referred to the concept of helioce
abhata has suggested it in his treatise Aryabhattiya.

skaracharya has also made references to it in his Magnum Opus **Sid
omani.**

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heliocentric theory of gravitation was also developed in ancient (around 500 B.C.) by Greek astronomers.

In the Vedic literature the Sun is referred to as the centre of spheres' along with the term Guru-tva-akarshan which seemingly refers to the Sun. The Vedas were composed around 3000 B.C. to 1000 B.C.

Indian astronomers like Aryabhatta and Varahamihira who lived between 476 and 587 A.D. made close approaches to the concept of heliocentrism.

In the **Surya Siddhanta**, an astronomical text dated around 400 A.D., the following appellations(name) have been given to the Sun:

It is denominated the **golden wombed (Hiranyagarbha)**, the blessed; as **generator.**"

It is also referred to as "**The supreme source of light (Jyoti)** upon the boundless darkness-**he revolves bringing beings into being, the creator of creatures**

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Surya Siddhanta also says "Bestowing upon him the scriptures (Vedas) and establishing him within the egg as grandfather of all worlds, he himself revolves causing existence." (Quoted from the Surya Siddhanta, translated by Rev. Ebenezer Burgess.)

What ancient Indian astronomers say comes close to the heliocentric model of gravitation, which was a thousand years later articulated by Copernicus and Galileo inviting severe reactions from the clergy in Rome.

Astrology

Following popularity of Jyotisha, which is of course the Sanskrit name for astrology.

There are many systems of astrology from many cultures the world over.

Babylonians, the Chinese, the Egyptians, the Greeks, the Mayans, and the Hindus.

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The astrology of ancient India is known by the name **Jyotisha**, which in Sanskrit means "the science of light".

It is also known as **Hindu Astrology**, and as previously said, **Vedic Astrology** comes from the ancient Vedas of India, reputed to be thousands of years old. Vedic astrology originally comes to us from the Rig Veda, the oldest of the Vedas, the spiritual Bible of ancient India.

The **Vedas** were originally an oral tradition passed down from family to family, generation to generation. They contain the **spiritual teachings of Hinduism**. In the latter part of their history the Vedas were put in a written form, and so is Jyotisha as well.

We also find **astrological references** abound in the great oral Epics of India, the **Mahabharata and the Ramayana**; particularly in the most famous portions of the Mahabharata, the **Bhagavad Gita**.

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h ancient works as the **Vedanga Jyotish** and the **Surya Siddhanta** f
light on both the astronomy and astrology of ancient India.

out the **5th century A.D.**, many of the previous **oral astrological tea**
re put into written form.

ny of India's most **well-known astrologer-sages** lived at this period o
h personages as **Parasara, Vaharamihira, Kalyana Varma and Mantr**
their masterpieces on Vedic astrology; Hora Shastra, Brihat J
avali and the Phaladeepika are still readily available today, having
translated into English many times over.

our times, such prolific Indian authors, as the late **Dr. B.V. Ramar**
popularized Vedic astrology in Western culture.

he last decade there has been a **resurgence of Vedic astrology in the**
tes facilitated by such American authors as James Braha, David Frawl
annie Gale Dreyer.

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and their books; Ancient Hindu Astrology for the Modern Western Astrologer; The Astrology of the Seers, and Vedic Astrology: A Guide to the Fundamentals of Vedic Astrology.

Vedic astrology of India is different from Western astrology in that Western astrologers use a different Zodiac.

There are two Zodiacs: Tropical and Sidereal. The difference between the two Zodiacs is currently 22 to 24 degrees.

Two vantage points determine perceptual reality. **Geo-centric (Earth) astrology** and **Helio-centric (Sun) astrology**.

The vantage point of the seasonal equinoxes, which characterizes Western astrology or vantage point of fixed stars, which characterizes Vedic astrology.

The second vantage point of Vedic astrology is the cosmological, spiritual vantage point of the ancient Hindu culture.

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Vedic astrology is a Vedanga, one of the six limbs of the Vedas and thus a natural extension of the spiritual belief systems of Hinduism.

The value system of ancient India is very different in its values and concepts of life from modern Western cultural viewpoint.

For example, the **purusharthas, or the four pursuits of life**, as outlined in the Vedas are: **Dharma, Artha, Kama, and Moksha**.

The Sanskrit word **Dharma**, means **our purpose/duty in life**. The word **Artha** reflects our attitude toward the accumulation of money and resources. **Kama** reflects the desires. Lastly, the word **Moksha** reflects the desire of every soul to enlighten itself from the confinement of this world.

These **pursuits** are qualified and **clarified** in the fundamentals of **Jyotisha** (Astrology) frameworks, such as this, and the **Hindu doctrines of Samsara, the belief in rebirth, past lives, and Karma**, lend a unique perspective to a Vedic astrology reading.

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Why has there been such an intensified interest in Vedic astrology in recent years in the west?

A well-respected philosopher and Western astrologer Richard Tarnas, in his masterpiece **The Passion of the Western Mind** wrote, has our materialistic and prosperous culture given the Western mind any peace of mind? Perhaps there is a growing restlessness in the Western mind that is looking for answers beyond the scope of our material and technological breakthroughs and achievements.

This search for answers takes many Western minds back to the Eastern minds of the Greeks and Babylonians as well as the rishis and sages of ancient India.

The popularity of **Deepak Chopra's** books such as **Quantum Healing** and an Indian born, western Doctor of Medicine is taking the **wisdom of India** and cross-fertilizing this knowledge with today's Western wisdom and technology.

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earliest of the Vedas exclaims: "If you want **to know your swadharma (personal purpose in life) consult a jyotishi** (a Vedic astrologer)."

Vedic astrology offers an ancient astrological perspective that asks these profound and confounding questions (Ex: **Who am I?, Why I am here**) questions asked by the very authors of the Vedas, the Puranas, the Brahmsutra, the Upanishads, and the Bhagavad Gita, who **asked these very same questions 5000 years ago.**