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Indian Divine Astronomy

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Abstract

Astronomy is the science of studying the movements of the earth, the planets and the other celestial bodies around the earth like sun, moon, stars etc. It is a field of applied mathematics. Ancient Indian Scientists like Aryabhata, Varahamihira, Vateshwara and others have made huge contributions to the field of astronomy. The present paper, apart from giving a brief overview of contributions in the field of astronomy also highlights the unique features of Indian astronomy over the astronomy elsewhere. The paper deals with explanation of the birth and death of earth and calculation of time and date with earth as reference as against the Gregorian system which is an individual based.

Keywords: *Astronomy, Manvantara, Panchabhuta, Years, Yuga*

1.0 Introduction

Astronomy, a field of applied mathematics, is the science of studying the movement of earth and the celestial bodies around. India is well known for the contribution in the field of Astronomy and is considered to be the motherland of Astronomical sciences. Movement of the moon, sun and other celestial bodies were not only observed and explained, but also the qualities of energies of the same were explained. These were at times where no tools/equipments like powerful telescope or modern day kind of powerful cameras and rockets were available. Thus the explanations given by many Indian astronomers are not merely based on physical observations but are largely based on visualization (dharshana) within themselves through a process called thapas or meditation; and hence is referred to as 'divine astronomy'.

Indian astronomy is not just about Motion of the celestial bodies but also studies the characteristics and impact of the energies of the celestial bodies on earth, and also on formation, sustenance and destruction (srusti-stiti-laya) of the celestial bodies.

Further, most of the explanations are in poetic form through what are traditionally called, the 'shlokas'. To give an example, the shloka,

"Vakrathunda mahaakaaya surya koti samaprabha

nirvignam kurumedeva sarvakaryeshu sarvada"

explains about the energy of the sun which is the primordial source of energy of the solar system. This *shloka* means as follows: light (of the sun) is wavy (*vakra*) and contains particles (*thundu*/*thunda*); hence *vakrathunda*. The volume occupied by the sun's light is the biggest volume one can think of in the solar system. Hence *mahakaaya*. The light from the sun being continuous, called '*nirvignam*'. The light is received by

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the *kuru* (planets) and *deva* (*panchabhutas* – the five elements). All the works at all times is done directly or indirectly by the sun's energy, and hence '*sarva karyeshu sarvada*'. Thus this *shloka* explains the quality of sun's light. Such an explanation about the quality of the sun's light since time unkown; centuries before modern scientists explained a similar theory called the 'wave-particle duality' (*vakra thunda* = wave particle) which fetched Nobel prize in physics. Thus, this is a classic example of how the *darshaniks (those who understood things with by the power of meditation, with no help of sense organs, also called* SAINTists) of the past with their divine powers could see the happenings of the universe at times when there were no powerful instruments as of now. Thus this is an explanation connected to divine Indian astronomy.

2.0 Contribution of Indian Astronomers

Indian Astronomers like Aryabhata, Varahamihira, Brahma Gupta and Bhaskaracharya made significant contributions to *astronomy* (Table 1). Further, there are several works wherein the authors did not want to mention their names and times since they felt that it was not their work, but are divine understanding, and they being only a media. Some of such works are Shaunaka Siddhaanta (S.), Atri S., Kaashyapa S., Vasishta S., Rowmaka S., Paitamaha S., Paraashara S., Gaarga S., Naarada S., Angira S., etc. On similar lines, beyond the names given in the table, several other Astronomers have contributed to the field of Indian Astronomy, *viz*., Govindaswamy-800-850AD, Vateshware (9th Century AD), Sreepathi (10th Century AD), Prthoodakaswamy (9th Century), Lakshmidasa (16th Century AD), Ganesha Daivagna (16th Century AD), Parameshwara (14th Century AD), Madhava (14th Century AD), Suryadeva (12th Century AD), Pruthoodakasswamy (9th Century AD) etc[1].

3.0 Life and Death of Celestial Bodies

Several aspects of creation and destruction of celestial bodies and earth are explained by Indian astronomers. Life time of sun is explained as 311.04 trillion years called the para within which life and death other the other celestial bodies exist. Typically, there is enough description of the life cycle of the earth which is also the subject matter in Indian Divine Astronomy. The explanation given in this regards is given as follows:

- Time taken by earth to make one rotation around the sun = 1 year (1 varsha).
- 4,32,000 years = 1 kali yuga.

Table 1. Typical contributions of Indian Astronomers

Astronomer/Mathematician	Time	Typical works
Aryabhata-I	5th Century AD	Aryabhatiyam Arybhata-Siddhanta
Varahamihira	505-587 AD	Pancha Siddhantika
Brahma Gupta	598-668 AD	Brahma Gupta Siddhanta Khanda-Khandyaka
Bhaskaracharya-I	~600 AD	Laghu Bhaskariya Maha Bhaskariya
Bhaskaracharya-II	1114-1185 AD	Graha Ganitham Gola Adhyaya
Madava	1340-1425 AD	Yuktibhasa Karanapaddhati

- This is further divided into 4 parts; *viz*., prathama, dwithiya, thruthiya and chaturtha paadas (parts) of 1,08,000 years each.
- Each of the paada is divided into 120 years referred to as daivi varsha. This 120 year is divided into two group of 60 years (60 samvatsaras) each.
- The 60 years are named as Prabhava, Vibhava, …… Plava, Shubhakrutu, Shobhakruthu ….. Krodhana, Akshaya samvatsaras. Currently we are in the Shubhakrutu samvatsara (as on 25th November, 2022)

- Currently we are in the Kali yuga which is prathama paada, Shubhakrutu samvatsara
- This is preceded by dwapara yuga which is = 8,64,000 years.
- This is preceded by Treta yuga which is = 12, 96,000 years.
- This is preceded by kruta yuga which is = 17,28,000 years.

Table 2. Sequence of creation of earth, sustenance and destruction of earth

Sl. No.	Name of the manvantara	State of earth	Stage
1	Swayambhuva	From the universal energy forms the Aakasha (ozone) during this manvantara	srusti
2	Swarochisha	Formation of Vayu (air)	
3	Utttama	Formation of Agni (fire)	
4	Raivata	Formation of Aapa (water)	
5	Tamasa	Formation of pruthvi (earth)	
6	Chakshusha	Birth of oshadis (medicinal (rakshak) vegetation) and vanaspatis (vegetation concerning food (poshak))	
7	Vaivasvata	Animals and human beings (*praanis*) take birth (This is the current manvantara)	sthiti
8	Sarvarni	Animals and human beings die (laya; matter gets converted into energy)	laya
9	Daksha Sarvarni	Plants, trees die	
10	Brahma Savarni	Earth gets energized and thus gets converted into energy	
11	Dharma Savarni	Water gets energized and gets converted into energy	
12	Rudra Savarni	The resulting ball of energy along with energy elevates to become higher energy	
13	Rochyadeva Savarni	Air elevates to become energy	
14	Indra Savarni	Ozone (aakash) energizes and becomes one with universal energy.	

- The sum of these four yugas which is equal to 43,20,000 years is called one chatur yuga, also called as Maha yuga[2].
- 71 Maha yugas form one manvantara.
- Astronomers have identified 14 manvantaras (Table 2) [3,4]. These 14 manvantaras togethor form one kalpa.

One kalpa is also the duration in which the earth is formed (*srusti*), stays with minor changes (*stiti*) and gets converted back into energy (*laya*). This is similar to water cycle; i.e., water – water evaporation – cloud formation – release of energy through thunder and lightning – hail stones – water cycle. As such the working of the entire universe is cyclic in nature.

Considering earth being composed of the five basic elements *viz*., *aakasha* (ether), *vayu* (air), *agni* (fire), *aapa* (water), *pruthvi* (earth) and vegetation and animals there on, the earth cycle is divided into 14 manvantaras (Table 2)

1 year has 2 Aayanas; they being uttarayana (beginning of sun's northerly course; the winter solistice) and dakshinaayana (beginning of sun's southern course); each of 6 months duration. During uttarayana (generally starting 14th January), the state of energy of the earth received from the sun increases, and during dakshinaayana (generally starting 21st June) it decreases;[5]. Further 1 year is classified into 6 ruthus, meaning six seasons; they being Vasanta (spring), Grishma (summer), Varsha (Monsoon), Sharad (Autumn), Hemanta (pre-winter) and Shishira (winter) each having 2 months[6].

Considering moon's cycle, one year is divided into 12 months (maasa). 12 months are Chaitra (March), Vaishsaka (April), and so on endiving with Magha (January) and Phalguna (February). Each maasa has divided into 2 pakshas they are Shukla paksha (involving waxing moon) and Krishna paksha (involving waning moon). Shukla paksha starts from 1st day to 15th day of a month i.e., Prathama (1st day), Dvithiya (2nd day) etc. upto Chaturdashi (14th day) and Pournima (15th day = full moon day). Similarly, Krishna paksha starts from 16th day to 30th day of a month is Prathama (16th day of the maasa and 1st day of the paksha), Dvithiya (17th day), etc. upto Chaturdashi (29th day), and Amavasya (30th day = New moon day)[7]. Thus it is possible to say, as to what is the current date with reference to birth of earth against any date of the currently used Gregorian calendar. To consider an example, 25th November, 2022 in Gregorian calender based on Christ, the date considering the earth as reference is Swetha Varaha kalpa, Vaivaswatha manvantara, 28th chaturyuga, Kali yuga, Kali prathama paada, 5123rd samvatsara, dakshinaayana, Hemantha rutu, Margashira maasa, shukla paksha, Dvithiya thithi. It is actually this date which is based on birth of earth, and beyond, that was used as a calendar system throughout India, before Gregorian calendar was introduced about a century back. While duration of day is further divided, to division even lesser than a nano second, their explanation is beyond the scope of this paper, but is worth studying to understand the depth of understanding of time by Indian Astronomers.

4.0 Energy of the Planets

Energy of the various celestial bodies are also explained by Indian astronomers. In this regard it is worth considering yet another very commonly used and well known shloka pertaining to celestial bodies; which goes like this, "Namah suryaaya chandraaya mangalaaya bhudhaaya cha guru shukra shanibhyascha raahavae kethavae namaha". This navagraha shloka list out the various grahas that have influence on the earth. Here, the word graha is to be considered from energy perspective, rather than matter perspective as considered in planets. While planets identify the various celestial physical bodies of the solar system which includes earth, grahas identify the various energies that influence the state of energy of earth which not only include the direct energy received from the celestial bodies, but also include the change of state of energy of the earth due to relative position of these bodies. These grahas are Surya (energy of the sun), Chandra (energy of the moon), Mangala (energy of mars), Budha (energy of mercury), Guru (energy of jupiter), Shukra (energy of venus), Shani (energy of saturn), Rahu (change of state of energy of earth due to lunar eclipse) and Ketu (change of state of energy of earth due to solar eclipse). Incidentally Rahu and Ketu are precisely referred to as chaaya grahas; which means they are not due to direct effect of the celestial bodies, but due to the relative positions of celestial bodies which results in change of state of energy of the earth as a result of shadows. Thus this one shloka remarkably indicates explanation of energy of the celestial bodies rather than

just the physical presence of the bodies as in the modern systems.

5.0 Conclusion

In this paper a brief review of works of Indian Astronomers are given. Indian astronomy is said to be 'divine' since the findings are meditation based in a pure state of mind. Indian astronomers look not only from motion of matter point of view, but also from energy point of view and also explains the creation and destruction of the celestial bodies. There is huge scope for Research in the area of Divine Indian Astronomers.

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