

## **Astronomy and Astrology : Poles Apart**

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### **Abstract**

Astrology and Astronomy are distinct fields, although they share a common historical link. However, the similarity ends here. Astronomy is the branch of science that studies everything outside of Earth's atmosphere. This includes objects in our solar system, such as the sun, moon, and other planets. It also includes things located very far away in outer space, such as other galaxies, distant stars, and black holes. Astronomers may also research sub-atomic particles and theoretical objects that may be out in space, such as dark matter. Astronomy often involves the use of scientific equipment, such as telescopes and satellites. It is, therefore, an evolving scientific discipline that studies physical properties of celestial objects, their positions and movements in the universe. It is a discipline of study that relies on empirical evidence and scientific validation and aims to understand the structure and evolution of the cosmos.

On the other hand, Astrology uses the positions of celestial bodies to make interpretations about human affairs, destiny and fate on hypothetical and /or trial & error methodology. It relies on mystical interpretations and subjective claims besides getting focused on the perceived influence of celestial bodies situated light years away on human events and personality. Astrology lacks empirical evidence and is not subject to scientific testing.

In ancient times, Astronomy and Astrology were closely intertwined. Early Astronomers also practiced Astrology, using their knowledge of celestial movements to predict events and understand human affairs. As science progressed, they started distancing as the distinctions became more pronounced. Astronomy evolved into a separate, rigorous discipline while Astrology remained a cultural practice with its own interpretations and beliefs. The terms Astronomy and Astrology are commonly confused, which isn't surprising, considering they both involve studying the stars and both begin with the combining form astro- (referring to stars or celestial bodies). However, only one of these star-gazing terms, Astronomy, refers to a recognized branch of science.

The desire to use celestial bodies to predict the material world, nature, environment, weather etc., and helped lead to the emergence of the science of Astronomy. Ancient civilizations, such as the Babylonians and Romans, correctly determined that celestial objects could affect Earth's environment, such as eclipses and movement of the Sun being responsible for seasons. At the same time, they often attributed too much to celestial influence because many cultures believed outer space to be the realm of the Gods and celestial events as proof that the Gods were influencing life on Earth. Most sources argue that Astronomy and Astrology truly split from each other during the Enlightenment period of the 1600s and 1700s, when the first telescopes were being invented and astronomers and physicists were able to use Isaac Newton's laws of motion and gravity to finally explain what was actually happening in outer space. Because both Astronomy and Astrology are interested in outer space, we hear some terms used in both subjects, namely, Constellations,

Zodiac, Solstices, and Conjunctions are some of the examples both Astronomers and Astrologers are interested in, although for entirely different reasons.

**Keywords :**

Astronomy, astronomer, Astrology, Astrologer, Pseudoscience, Rationality, Universe, Cosmos, Eclipse, Palmistry, Jyotishi, Planets, Light Year, Scientific Temperament, Zodiac, Horoscope.

The students of Science, it is assumed, are generally rationalists and do not believe that supernatural events can influence human lives. They obviously do not believe in astrology. This should be true of all educated people. Yet it can not be contested that all educated people are not rationalists. They are superstitious and abhor scientific temperament. For example, during eclipse which is an astronomical event, many scientists will go home and protect themselves from the evil effects of eclipse and take a bath after the eclipse is over. There are educated people who empty vessels of all cooked food, instead of keeping it in the refrigerator before eclipse, because they believe that any food which has received "radiation" of the eclipse is inedible. Though, it is assumed, humanists and rationalists do not believe that planets and stars influence human affairs, they are not always able to tell why they do not believe. As rationalists, they should have a sound, rational, scientific basis for not believing common perceptions in society. Unfortunately, they do not always bear this conviction. They must possess knowledge as to why the planets and stars can not have any influence on human beings and their affairs.

"The fault, dear Brutus, lies not in our stars but in ourselves", thus wrote Shakespeare living in 16th Century. Apparently, the Bard of Avon did not believe in astrology, though Julius Caesar and Brutus, living in centuries earlier believed. The belief in astrology was or is limited to India and some other Asian countries. It was at one time widespread in Western countries, though now it is not. It is still accepted in Africa on a wide scale. In India, of course, it is very popular even among the educated. As readers must have noticed, almost every media, print and electronic as well as audio-visual media, carries weekly forecast of astrology in terms of "Rashi". The forecasts are in vague language and two forecasts do not agree. It is, therefore, instructive to learn as to how astrological forecast became the fashion of the day. It is necessary to know the basis of astrology even for those who do not believe in forecast.

Carl Sagan(1) has mentioned that astrology has existed for thousands of years. But theories about how the planets influence, assuming they do, the earth and earthlings have changed from era to era. Stars and planets have served as guides to travellers on sea and land when there were no maps. In ancient times, the stars up in sky were at some time so important that we called them "Devas" (Gods). Nakshatras were also important for the cultivators. Later, when five planets, then known, wandered through Nakshatras, they also received their status as "Devas". The Nakshatras, the "Grahas" (planets) and their conjunction were thought to be able to produce good or evil effects, thus giving rise to astrology. The members of the priestly class (Jyotishis) who were able to predict the movement of Nakshatras and planets were shrewd persons. Originally their predictions were for the whole world and later they were narrowed down to apply to individuals. Gullible people,

out of fright or curiosity, believed these Jyotishis. It was not difficult to work upon the minds of weak persons. For example, the Sun became an object of worship because the Sun was thought to be Deva (God). Even now many morning walkers can be seen to do “pranams” to Sun which is regarded as “Surya Narayan” in Hindu mythology. Even a High School student knows that Sun is a star made up of hydrogen and helium gases in solidified form. With advent of science, astronomy has revealed the enormity of the universe and the distances between the earth, the stars and planets being a few light years. Apart from the worshippers of the Sun, generally the people will be surprised to know that the Sun is only a star, one of a billion of stars which are millions and millions of miles away from the Sun and we know little about them. It is sufficient to realize that all the planets we know, revolve around the star Sun and the planets together with Sun form what we call solar system or solar world. Therefore, even elementary factors of solar system will compel one to discard and disbelieve astrology. No Astronomer will ever believe in astrology. On the obverse, no Astrologer, so obsessed and superstitious they are, will try to understand the significance of astronomical event and facts.

Sir Julian Huxley (2) has, in his autobiography, mentioned that our universe is like pebbles on the seashore and man is a creature in a pebble. Let us take the liberty of mentioning few facts of astronomy for the purpose of understanding the mischievous claims of astrology. Those interested in greater details may fruitfully refer to books on Astronomy by Patrick Moore (3), former President of British Astronomical Association, and Iain Nicolson (4), a Senior Lecturer in Astronomy. Both books are with illustrations. Formerly it was believed that the earth was the centre of the universe and that planets and stars revolved around it in a circular motion. Copernicus concluded after a study that it was the sun that was at the centre of the universe and that planets revolved around the sun. Subsequent to his death in 1543 C.E., Galileo, an Italian professor of mathematics, confirmed the view of Copernicus. After him, Kepler explained that the universe could be explained and better understood if the sun is at the centre and the planets moved around in orbits which were not circular, but elliptical. Newton explained that the elliptical nature of orbits was because of gravitational force of the sun. This is not the place for elucidating Kepler’s laws and Newton’s principles. The extant astronomical knowledge shows that there are nine planets of various sizes and masses which are revolving around in various orbits at different speeds. Earth revolves around the sun in an elliptical orbit in approximately 365 days giving rise to a year while it rotates around its own equator in approximately 24 hours giving rise to a day. The astronomers have calculated that the Earth is 91 millions of miles away from the Sun. Two planets, Mercury and Venus, are nearer to the Sun being at distances of 36 and 67 millions of miles, respectively. Saturn (Shani), which has a prominent place in Hindu mythology, rotates at 10 hours, revolves around the sun in 29 years and is 886 million miles away from the sun. The other planets are still far away from the sun.

Astronomers have calculated the vast distances of the planets from each other and from the Earth. Does it stand to reason that they can have any influence on man who is one of the billions and billions of creatures on the earth? There are better reasons why belief in astrology cannot be sustained. According to Parasar School of Astrology (5), which is the most popular school on astrology, there are nine planets which include the Sun, Mars,

Venus, Mercury, Jupiter, Saturn, Moon, Rahu and Ketu. The Parashara School of Astrology refers to the system of Vedic astrology developed by the sage Parashara, who is believed to have written the Brihat Parasara Hora Shastra, a foundational text in Indian astrology. This school emphasizes the importance of houses in the birth chart, considers them as primary indicators of life events, and uses their lordships for determining the impact of planetary periods (dashas). It is now known that the Sun is a star, not a planet; the moon is a satellite of the earth and not a planet; and Rahu and Ketu do not exist at all. Yet these entities are said to exist and influence human beings. Besides, the astrologers did not take into account newly discovered planets – Uranus, Neptune and Pluto. These planets have been knocking in vain at the doors of astrologers for recognition. An ill-founded belief, particularly in South India, is that “Rahukala” is inauspicious and humans should not do any work at that time. All the trains, planes, buses plying at that time should be ill-fated. It is ridiculous to imagine that a train should wait for the green signal of astrologers to move. Imagine the scenes at the bus stands, railway stations and airports.

The distances between stars are so vast that they are measured in what is called a light year. Light travels in space at a speed of 186,000 miles per second (300,000 Kilometres). Light year means the distance light travels in one year. On this scale, it is seen, the nearest star is over 4 light years away. An interesting example has been given by Prof. K.D. Abhyankar of Osmania University, Hyderabad (6). The largest planet in the solar system is Jupiter which is 43 light minutes away and the farthest planet, Pluto, is 5½ light hours away. If an astronaut goes to Pluto and communicates with us, it will take five and half hours to reach us through radio message. The stars are further away. Does it stand to reason that stars and planets can have influence on us? Prof. Abhyankar points out that our solar system is insignificant compared to the universe. The Earth on which we live is a tiny speck in the solar system and man is nothing compared to the Earth physically.

Man is intellectually among the topmost creations of nature. We should see to it that we use our intellect in rational and logical thought and not fall prey to superstitious beliefs which are remnants of an earlier, less developed, stage of civilization. Let us concentrate on Earth instead of all other Planets. The Earth, as seen earlier, revolves around the sun in an elliptical orbit in about 365 days. This elliptical orbit is hypothetically divided into 12 parts, constellations. The Saturn stays in each constellation for 2½ years. The Saturn travels 29½ years around the sun. If one is born when Shani is in line with the constellation under which one is born, the constellation preceding and following the constellation under which one is born are significant according to Indian astrology. The time 23 in the constellation when one is born and the two constellations – one preceding and one following – is 7½ years – that is Sadesat in Indian languages. This period of 7½ years is the most dreaded period for Hindus. It is hurtful and potentially dangerous. We know that the existence and sustenance of life on Earth is made possible by the star Sun. The Sun is not too far away; otherwise we would be frozen. It is not too near, lest we be burnt. This fact is a far cry from the claim that the star affects you otherwise.

Horoscopes are charts containing the pictures of constellations, including the constellation under which you are born. Despite the distances of constellations and stars shown above,

people try to match horoscopes for marriages. It is safer to have medical certificates of intended spouses to check whether they have HIV or Aids. Thousands of people perished in “Kanishka” plane disaster, Latur and Gujarat earthquakes, Andhra Pradesh cyclone, Tsunami disaster, etc. Were they all born under the same constellation? The effect of planets (grihas) can be seen by the fact that in February, 1982, eight planets were in conjunction (Ashta Griha Koot), but nothing untoward happened, despite the astrological predictions of doomsday. In France, one institute sent to about 200 persons a horoscope and a statement of events for the previous five years, requesting them to inform whether the horoscope represented their life and whether the statement contained the real incidents in their life. Ninety percent of the correspondents agreed with the horoscope and the statement. What is unusual about it? It was the same horoscope and the statement – faith played the trick.

Astrology is built upon faith. It is not a Science because Science is never built upon faith. At some time there was a craze for Vedic astrology. A close reading of Vedas discloses that nowhere the Vedas contain any reference to astrology. Nor do the Upanishads. One cannot help referring to the fact that University Grants Commission invited the Universities in India to start astrological courses. This was when Murli Manohar Joshi of the BJP was HRD Minister. Fortunately, most of the Universities declined the invitation. Is astrology a science? The answer is an emphatic “No”. Astrology makes use of no basic rules. Are failed predictions accepted disproof of theory, as true scientists do? Astrologers have probably not heard of Copernicus, Galileo, Kepler and Newton and the knowledge accumulated over centuries. It can be argued that weather forecasts often are found to be false or inaccurate. But in weather forecasting, a complex calculation of various conditions is involved. Weather forecasters admit that sometimes they go wrong. Do the astrologers admit similarly? There is no experimentation or testing of facts. There can be only one science of a subject for the whole world whereas there are many systems of astrology which quite often contradict each other. Why do some people believe in astrology? Firstly, astrology has psychotherapeutic effect which brings solace to human mind. If you succeed, point out what is good in the forecast. There is always, in each forecast, both good and bad. Even a Papal advisor Francesco Guicciardini (1483-1540) of Italy bemoaned (7) : “How happy are astrologers if they tell one truth to hundred lies, while other people lose all credibility if they tell one lie to hundred truths.” “Stargazing and astrology, forecasting luck or unlucky events by signs, prognosticating good or evil, all these things are forbidden”, said Buddha. Vivekananda said that astrology is a sign of weak minds. Stephen Hawkins in a speech in Delhi observed that the reason most scientists don’t believe in astrology is that it is inconsistent with our theories which have been tested by experiments. In the year 1975, as many as 189 scientists, including 19 Nobel Prize Winners, pointed out that people who believed in astrology have no concept of the distances from the earth to planets and stars. They advised that we must all face the world and “we must realize that our future lies in ourselves and not in the stars”. . Therefore, we must regard astrology as anti-humanist. It denies the free will of man. It is anti-science. The edifice of modern science is built upon of sifting sands of constantly questioning. Science is constant interrogation of the world whereas astrology is stagnant. It is immoral because a criminal might argue that he committed a crime because

the stars compelled him to. Astrology, strictly defined, denies the possibility of choice. At least in this 21st Century man must shake off his belief in astrology.\

In Figure I, we have shown the revolution of Earth around the Sun in the course of the year, where we see the Sun against different constellations. Astrologers call the star grouping which the Sun is in front of when you are born your “sun sign.”(Illustration from Voyages through the Universe © 2004 Cengage/Brooks-Cole.)

The Astrologers are a kind of Quack Doctors in as much as they prescribe wearing the following “Stones” to come out of evil effects of planets, the chemical composition of these so-called medicines are also given hereunder. The Astrologers make us believe that Sun, Jupiter and Mars are Male Planets. Venus, Mercury and Moon are Female Planets. Saturn, according to them, is a dormant Planet. Saturn, Sun, Rahu and Ketu are very harmful and evil types. The rest are not that bad. Jupiter, Venus, Mercury and Moon are helping types. Therefore, according to this school of believers, five planets are bad and four are good. Needless to explain that these are baseless premise.

Planet	Prescription	Material Composition
Mars ( Mangal )	Prabal	Calcium Carbonate
Mercury (Budh)	Pokhraj	Aluminium Silicate
Jupiter (Brihaspati )	Mukto / Perl	Calcium Carbonate
Venus ( Sukra)	Diamond	Carbon
Saturn ( Shani )	Neela	Aluminium Oxide+ Titanium( to look blue)
Sun ( Surja)	Chuni	Aluminium Oxide+ Ferric Oxide ( to look red)
Moon ( Chandra )	Baidurja	Aluminium Oxide+ Berilium
Rahu	Gomed	Aluminium Silicate
Ketu	Panna	Aluminium Oxide + Berilium or Chromium ( for colour )

Yet another group, besides making Horoscopes, also specialise in Palmistry and mark impact and dent made by planets on individual lives. Palmistry, also known as hand reading or chiromancy, is a pseudo-scientific practice that interprets personality traits and future events by analysing the physical features of the hand, particularly the lines and shapes on the palm. It is a cultural practice with various interpretations across the globe, where hands are seen as portals revealing insights into a person's life. Some of the major lines include the Life Line, Heart Line, Head Line, Fate Line, and Sun Line, among others. Each line's length, depth, and clarity, as well as its relation to other lines, are interpreted to understand various aspects of a person's life, including character, health, and career. This is also another bogus and deceptive approach to fool the people and vitiate their minds with supernatural thoughts. When a child remains in the womb of mother for ten months or so, the baby before birth has to stay in cramped condition within a very small space and has to keep the palm closed. Lines in the soft and tender palms develop slowly during this period. After

birth and with aging, these lines become more developed and prominent. These lines can not be correlated with future of the person.

Astrology seems scientific to some people because the horoscope is based on an exact datum: the subject's time of birth. When astrology was set up long ago, the moment of birth was considered the magic creation point of life. But today we understand birth as the culmination of nine months of steady development inside the womb. Indeed, scientists now believe that many aspects of a child's personality are set long before birth. I suspect the reason astrologers still adhere to the moment of birth has little to do with astrological theory. Almost every client knows when he or she was born, but it is difficult (and perhaps embarrassing) to identify a person's moment of conception. To make their predictions seem as personal as possible, astrologers stick with the more easily determined date. 3. If the mother's womb can keep out astrological influences until birth, can we do the same with a cubicle of steak? If such powerful forces emanate from the heavens, why are they inhibited before birth by a thin shield of muscle, flesh, and skin? And if they really do and a baby's potential horoscope is unsatisfactory, could we delay the action of the astrological influences by immediately surrounding the newborn with a thin cubicle of steak until the celestial signs are more auspicious ?

Dermatoglyphics and palmistry both study the intricate features of the human palm, like fingerprints, creases, shapes, and mounts, but their purposes differ greatly. Dermatoglyphics is a scientific field examining these patterns for genetic and medical insights, while palmistry interprets them to reveal personality traits and predict future event. The former relies on empirical data, whereas the latter is based on the 12th-century text Samudrika Shastra. Further research is needed to explore any potential links between these two approaches (8).

Scientific literature regards palmistry as a pseudoscientific or superstitious belief (13). Psychologist and noted sceptic Ray Hyman has written (8) :

I started reading palms in my teens as a way to supplement my income from doing magic and mental shows. When I started I did not believe in palmistry. But I knew that to "sell" it I had to act as if I did. After a few years I became a firm believer in palmistry. One day the late Stanley Jaks, who was a professional mentalist and a man I respected, tactfully suggested that it would make an interesting experiment if I deliberately gave readings opposite to what the lines indicated. I tried this out with a few clients. To my surprise and horror my readings were just as successful as ever. Ever since then I have been interested in the powerful forces that convince us, reader and client alike, that something is so when it really isn't.

Even if we give astrologers the benefit of the doubt on all these questions — accepting that astrological influences may exist outside our current understanding of the universe — there is a devastating final point. Put simply, astrology doesn't work. Many careful tests have now shown that, despite their claims, astrologers really can't predict anything. After all, we don't need to know how something works to see whether it works. During the last few decades, while astrologers have somehow always been a little too busy to conduct statistically valid tests of their work, physical and social scientists have done it for them. Let's consider a few

representative studies. Psychologist Bernard Silverman of Michigan State University looked at the birth dates of 2,978 couples who were getting married and 478 who were getting divorced in the state of Michigan. Most astrologers claim they can at least predict which astrological signs will be compatible or incompatible when it comes to personal relationships. Silverman compared such predictions to the actual records and found no correlations. For example “incompatibly signed” men and women got married as frequently as “compatibly signed” ones. Many astrologers insist that a person’s Sun sign is strongly correlated with his or her choice of profession. Indeed, job counselling is an important function of modern astrology. Physicist John McGervey at Case Western Reserve University looked at biographies and birth dates of some 6,000 politicians and 17,000 scientists to see if members of these professions would cluster among certain signs, as astrologers predict. He found the signs of both groups to be distributed completely at random. To overcome the objections of astrologers who feel that the Sun sign alone is not enough for a reading, physicist Shawn Carlson of the Lawrence Berkeley Laboratory carried out an ingenious experiment. Groups of volunteers were asked to provide information necessary for casting a full horoscope and to fill out the California Personality Inventory, a standard psychologists’ questionnaire that uses just the sorts of broad, general, descriptive terms astrologers use. A “respected” astrological organization constructed horoscopes for the volunteers, and 28 professional astrologers who had approved the procedure in advance were each sent one horoscope and three personality profiles, one of which belonged to the subject of the horoscope. Their task was to interpret the horoscope and select which of the three profiles it matched. Although the astrologers had predicted that they would score better than 50 percent correct, their actual score in 116 trials was only 34 percent correct — just what you would expect by guessing! Carlson published his results in the December 5, 1985, issue of the prestigious scientific journal *Nature*, much to the embarrassment of the astrological community. Other tests show that it hardly matters what a horoscope says, as long as the subject feels the interpretations were done for him or her personally. Some years ago French statistician Michel Gauquelin sent the detailed astrological profile for one of the worst mass murderers in French history to 150 people and asked how well it fit them. Ninety-four percent of the subjects said they recognized themselves in the description. Geoffrey Dean, an Australian researcher who has conducted extensive tests of astrology, reversed the astrological readings of 22 subjects, substituting phrases that were the opposite of what the horoscopes actually stated. Yet the subjects in this study said the readings applied to them just as often (95 percent of the time) as people to whom the correct phrases were given. Apparently, those who seek out astrologers just want guidance, any guidance. Some time ago astronomers Culver and Ianna tracked the published predictions of well-known astrologers and astrological organizations for five years. Out of more than 3,000 specific predictions (including many about politicians, film stars, and other famous people), only about 10 percent came to pass. Veteran reporters — and probably many people who read or watch the news — could do a good deal better by educated guessing. If the stars lead astrologers to incorrect predictions 9 times out of 10, they hardly seem like reliable guides for decisions of life and affairs of state. Yet millions of people seem to swear by them. Clearly, those of us who love astronomy cannot just hope that the public’s infatuation with astrology will go away. We must speak out whenever it is useful or appropriate — to discuss



the shortcomings of astrology and the shaky ground it is based on. Those of us working with youngsters can use these ideas to develop a healthy scepticism in the students and encourage an interest in the real cosmos — the one of remote worlds and suns that are mercifully unconcerned with the lives and desires of the creatures on planet Earth. Let's not allow another generation of young people to grow up tied to an ancient fantasy, left over from a time when we huddled by the firelight, afraid of the night (9).

French astronomer Jean-Claude Pecker has pointed out that it seems very small-minded of astrologers to limit their craft to the influences of the bodies in our solar system. Billions of stupendous bodies all over the universe should add their influence to that of our tiny little Sun, Moon, and planets. Has a client whose horoscope omits the effects of the star Rigel, the Crab Nebula pulsar, and the Andromeda Galaxy really had a complete reading?

Let the confusion and consequent unscientific impacts of the so-called benefits of Astrology on human beings, particularly on those belonging to vulnerable sections and communities, be discarded once and for all towards our journey to a society enriched with Science and Scientific Temperament. In a civilized society we deplore all systems that judge individuals by sex, skin color, religion, national origin, or other accidents of birth. Yet astrologers boast that they can evaluate people based on another accident of birth — the positions of celestial objects. Isn't refusing to date a Leo or hire a Virgo as bad as refusing to date a Catholic or hire a black person?

#### Figure I



Figure I.pdf

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