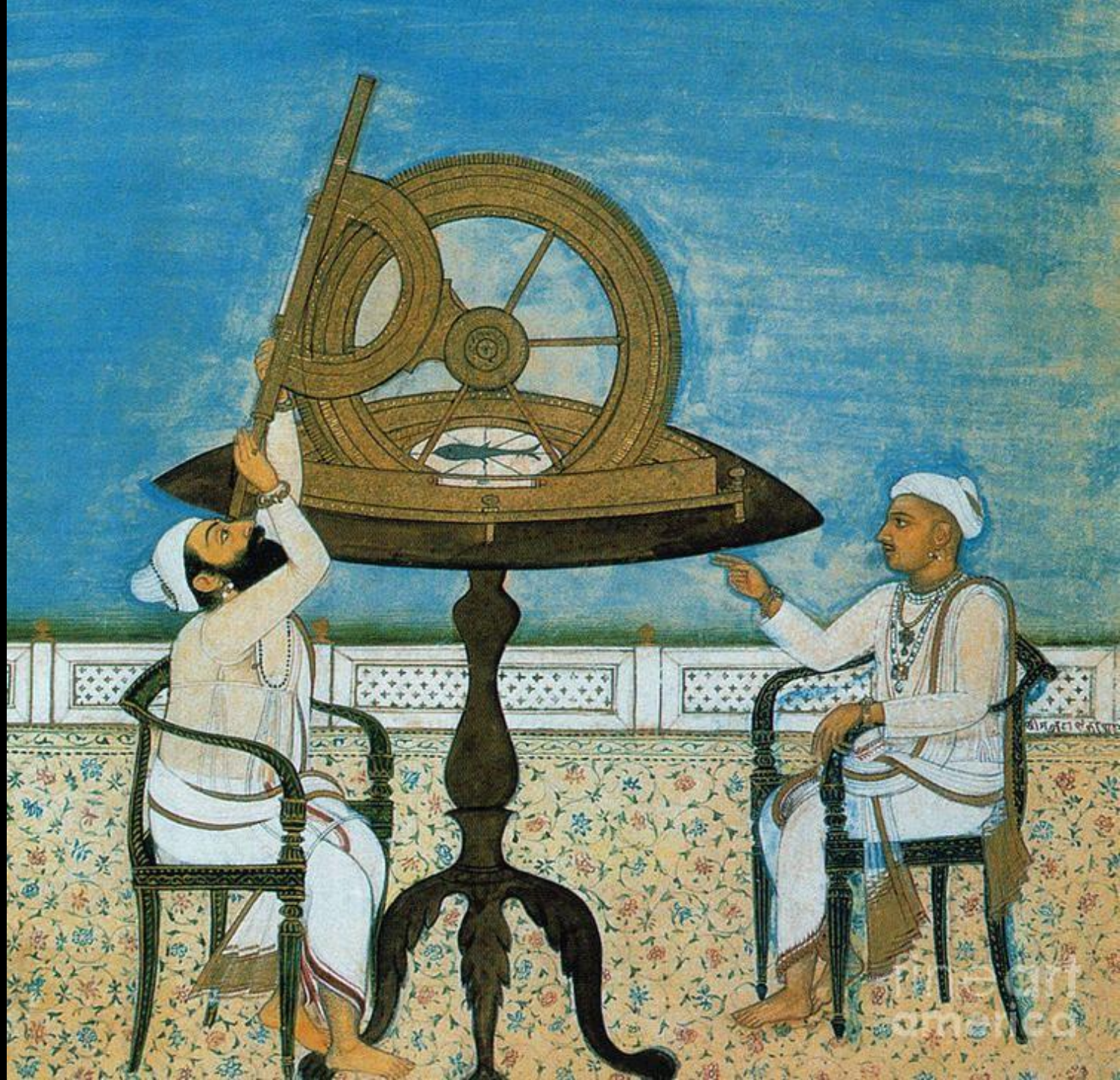


A night sky photograph featuring the Milky Way galaxy. The galaxy's core is visible as a bright, orange-hued band of light, stretching vertically through the center of the frame. The surrounding space is filled with numerous stars of varying brightness and colors, creating a dense field of light points. The overall background is a deep, dark brownish-black.

WELCOME!

Deciphering the Cosmos: A Sampling of Famous Skywatchers

- Nasir al-Din al-Tusi
- Galileo Galilei
- Johannes Kepler
- Benjamin Banneker
- Henrietta Leavitt
- Edwin Hubble
- Cecilia Payne-Gaposchkin
- Leslie Peltier



Who is this “Dave Leake” character?

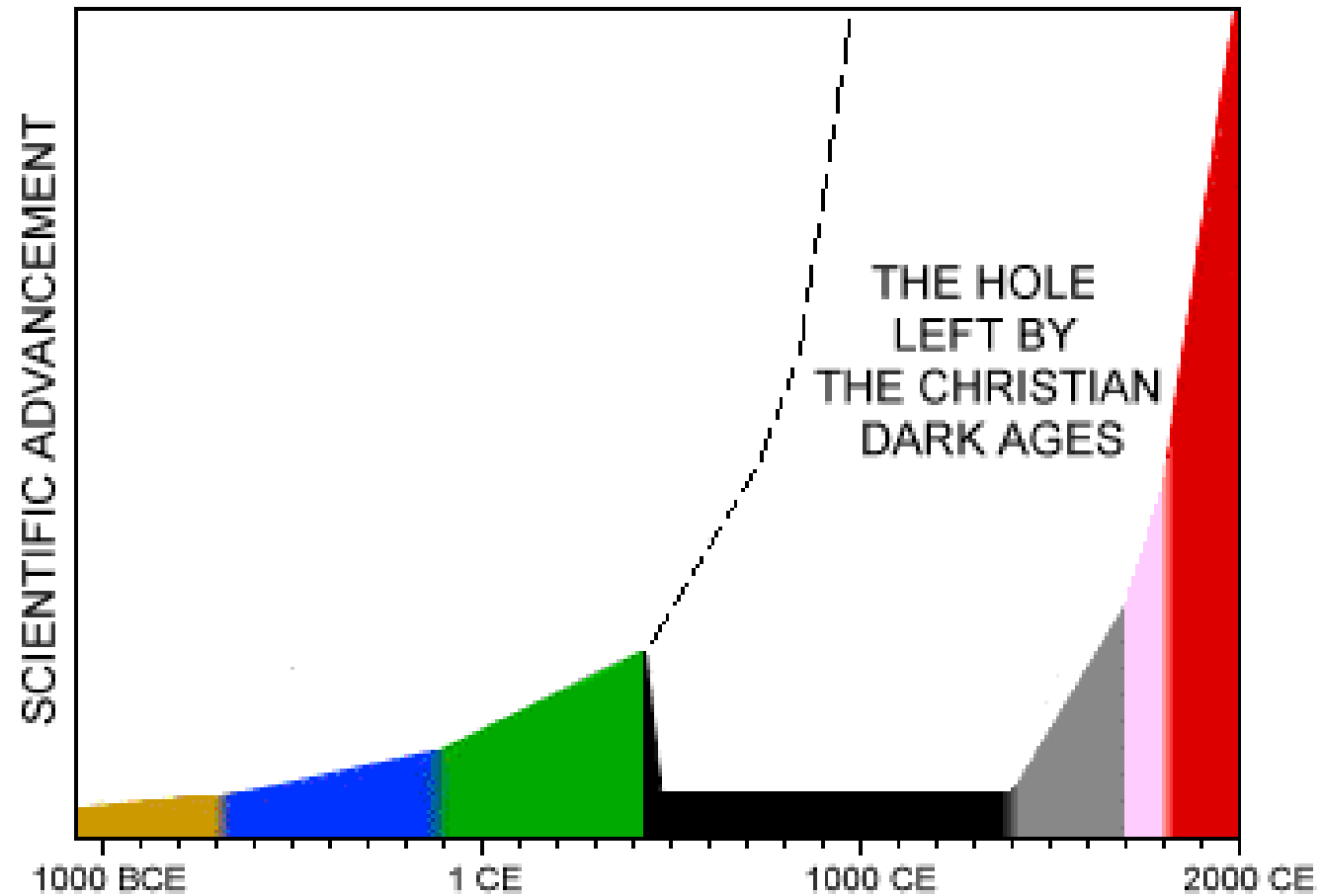


- Originally from Decatur
- Degrees in physics & science education
- Taught physics & astro at Parkland College for 30 years (retired July, 2019)
- Former director, William Staerkel Planetarium
- Founder, CU Astronomical Society
- Past prez, Great Lakes Planetarium Assoc.
- “Solar System Ambassador”
- Not a historian!

Nasir al-Din al-Tusi

...and the Ancient Sky

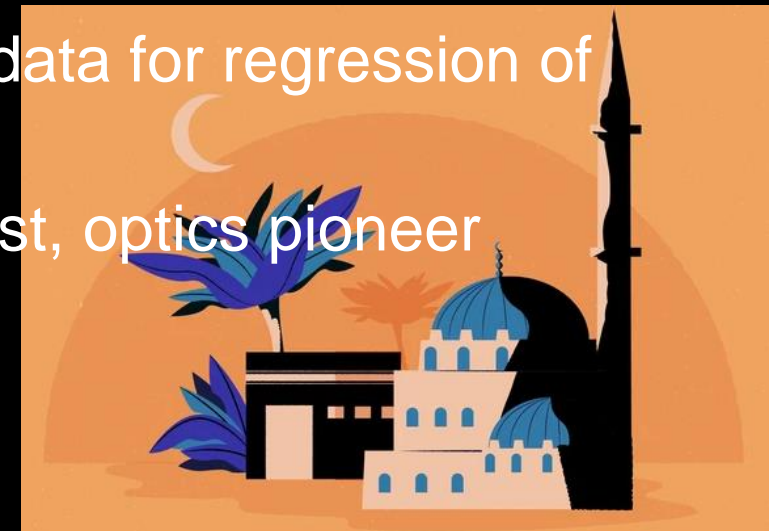




- Egyptian
- Greek
- Roman
- Christian Dark Ages
- Renaissance
- Age of Enlightenment
- Modern Science

Arabic Astronomers

- Abu Ma'shar (787-886) – can know the divine by studying creation
- Al-Khwarizmi (<850) – regulated times of daily prayer, algebra, tables, map
- Al-Battani (858-929) – Best calculations since Ptolemy, improved year & precession, apogee of Sun
- Al-Sufi (903-986) – wrote “Book of Fixed Stars,” integrated star catalog with Arabic terminology, constellation boundaries
- Ibn Yunus (<1009) – improved instruments, provided data for regression of Moon, direction of Mecca
- Ibn al-Haytham (965-1040) – wrote critique of Almagest, optics pioneer
- Ibn al-Shatir (1304-1375) – Earth as true center



Al-Sufi's star chart

كوكب الذئب الأصغر على تياره في السماء



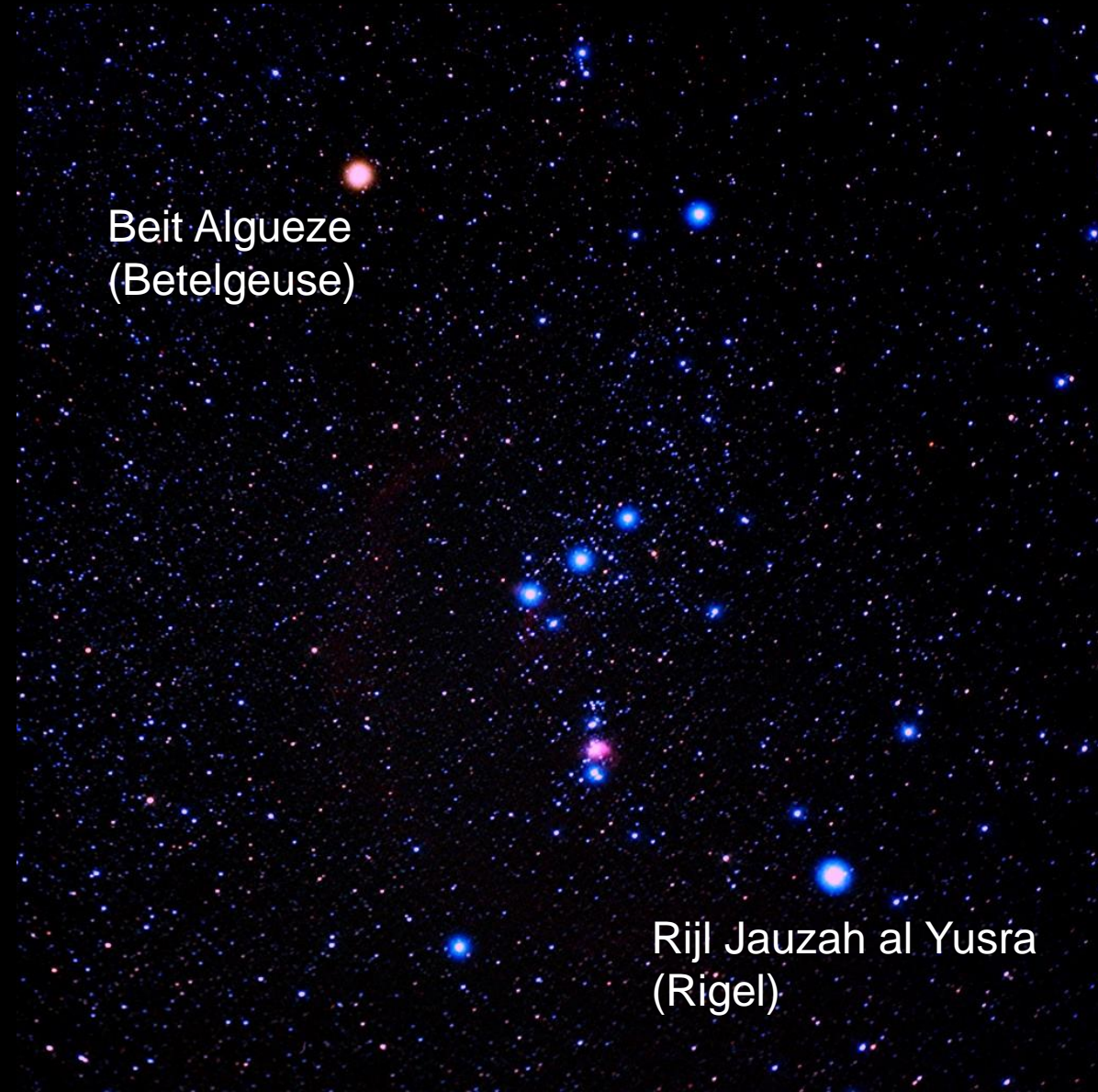
المنقوشة بالحجره هي من الصور والنواحي المنقوشة بالسواد العمل المجره هو خارج الصور والمنقوشة بالسواد بلا علامه هي التي لم يذكرها بطليموس

جدول كوكب الذئب الأصغر زياده بـ مـ بـ على ما في الجدول

العرض		الطول	الارتفاع		الوصف
الارتفاع	العرض		الارتفاع	العرض	
١	١	١	١	ب	الذي على طرف الذئب وهو الجذوف
٢	٢	٢	٢	ب	الذي بعده على الذئب
٣	٣	٣	٣	ب	الذي بعده قبل مغز الذئب
٤	٤	٤	٤	ب	الجنوبي من الضلع المتقدم من ضلع العنق
٥	٥	٥	٥	ب	الشمالي من هذه الضلع
٦	٦	٦	٦	ب	الجنوبي من اللذين في الضلع التاليه انوار الفرفرف
٧	٧	٧	٧	ب	الشمالي من هذه الضلع احق الفرقتين
فذلك سبعه كواكب منها من القدر الثاني واحد ومن الثالث اثنين ومن الرابع ثلثه ومن الخامس واحد					
الذي تحتها وليس من الصوره					
٨	٨	٨	٨	ب	الجنوبي الذي على سنها من الفرقتين

Ursa Minor (Little Dipper)

The Arabic influence



Beit Algueze
(Betelgeuse)

Rijl Jauzah al Yusra
(Rigel)

Naṣīr al-Dīn al-Ṭūsī Muslim astronomer (1201-1274)

Naṣīr al-Dīn al-Ṭūsī (*al-Toosy*) created the Islamic world's most important observatory at Marāgha, in Persia (modern Iran).

Al-Ṭūsī designed the building, assembled a staff of astronomers, and ran the observatory for about fifteen years. At the same time, he developed new theories to explain the motion of the planets, and wrote over 150 books and essays to explain his ideas. He was one of the greatest contributors to the Islamic "science of the stars."

More than 850 years ago, a Persian instrument maker named Bakh (Bak) made the astrolabe for Sultan Alau al-Din Muhammad. We know this because Bak recorded his name and that of the Sultan on his work. He also said thanks to his teacher, the astrolabe-maker Hishām, whom he calls the "teacher of the age." This astrolabe represents the long Persian tradition of instrument making.

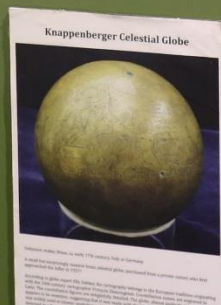


The astronomers were a cosmopolitan group, including Persians, Arabs, and even a Chinese scholar. Al-Ṭūsī directed them in making detailed observations of the heavens using the giant instruments. In a few years they produced a new, more accurate set of astronomical tables which were widely used by both Muslim and European astronomers.

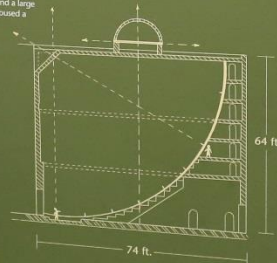


Al-Ṭūsī proposed new ideas to improve the Greek astronomer Ptolemy's model of the movements of the planets. This diagram illustrates the mathematical precision of his work. Many astronomers, including Copernicus in the 16th century, were influenced by his ideas.

This observatory at Marāgha was built 300 years before its first European equivalent. Though telescopes had not yet been invented, it was equipped with immense quadrants and a large armillary sphere. The building also housed a library of thousands of books.



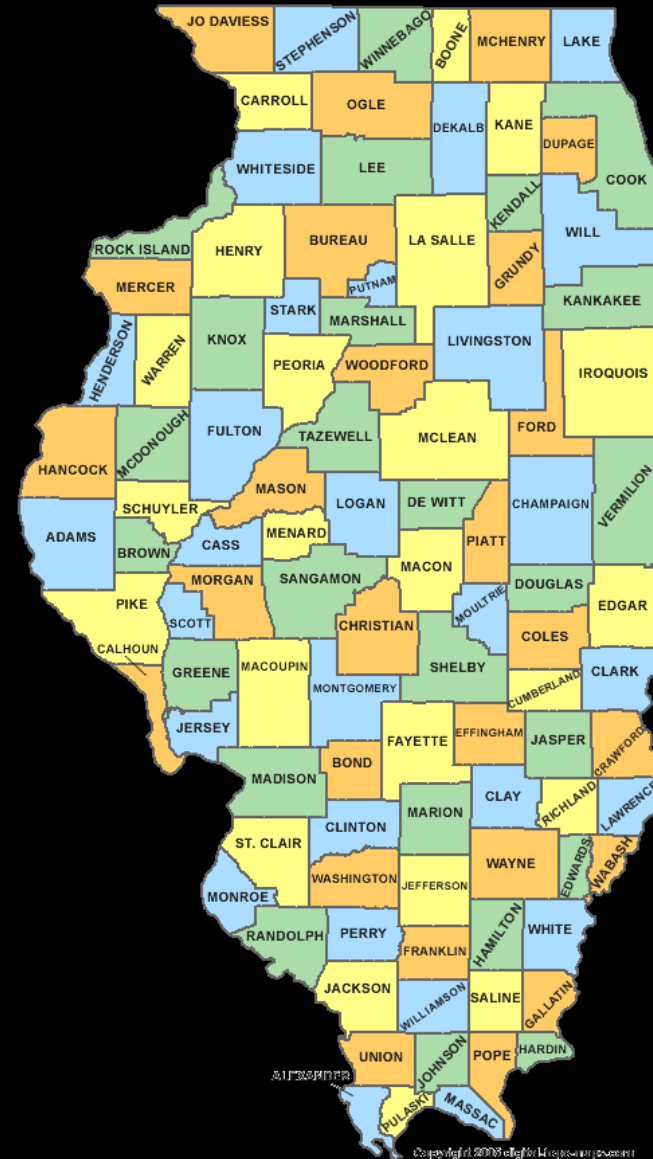
A German astronomer made this 17th-century globe in Germany. It is the only one of its kind in the world. The globe is made of brass and is 1.5 meters in diameter. It is the only one of its kind in the world. The globe is made of brass and is 1.5 meters in diameter. It is the only one of its kind in the world.

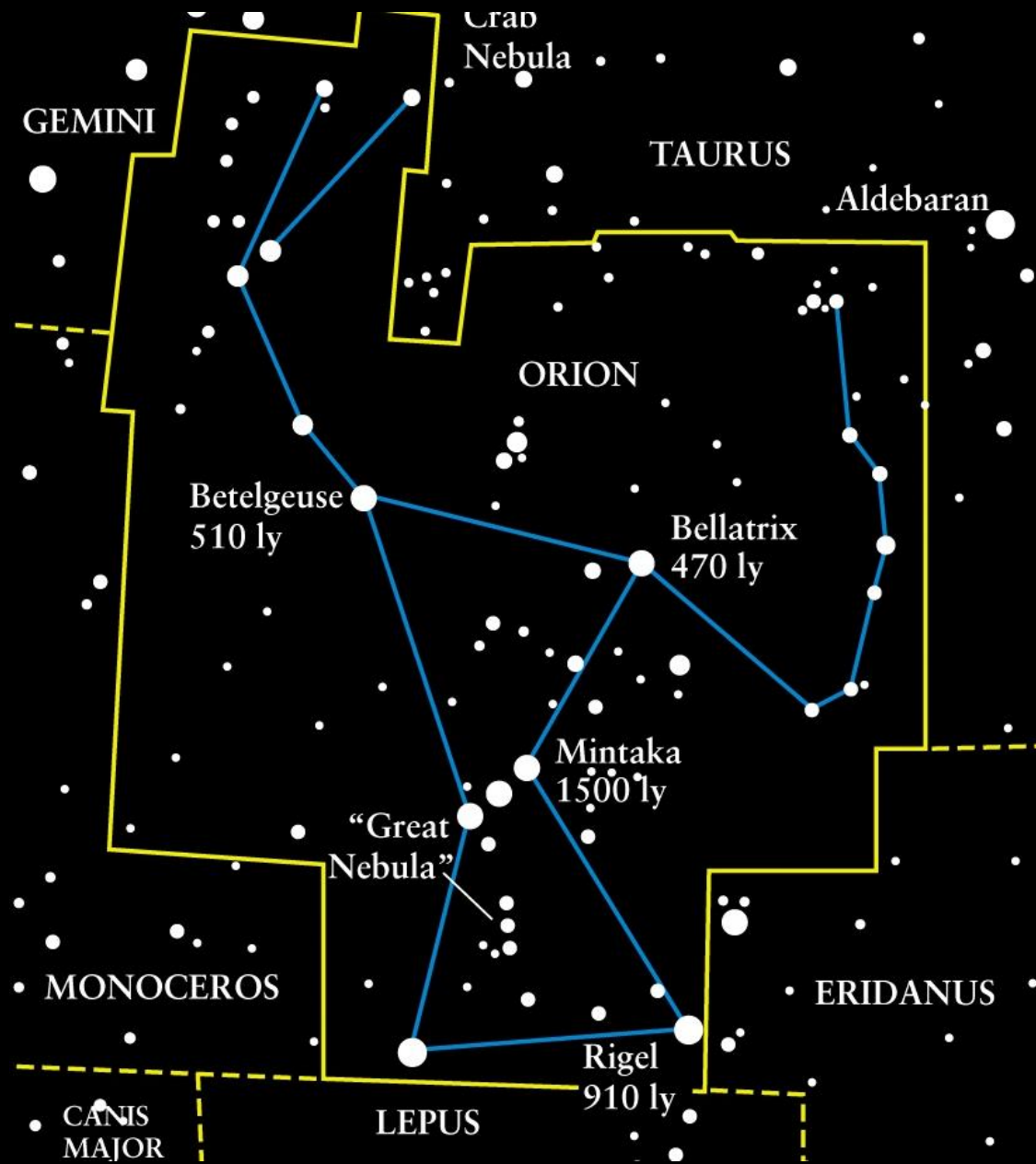


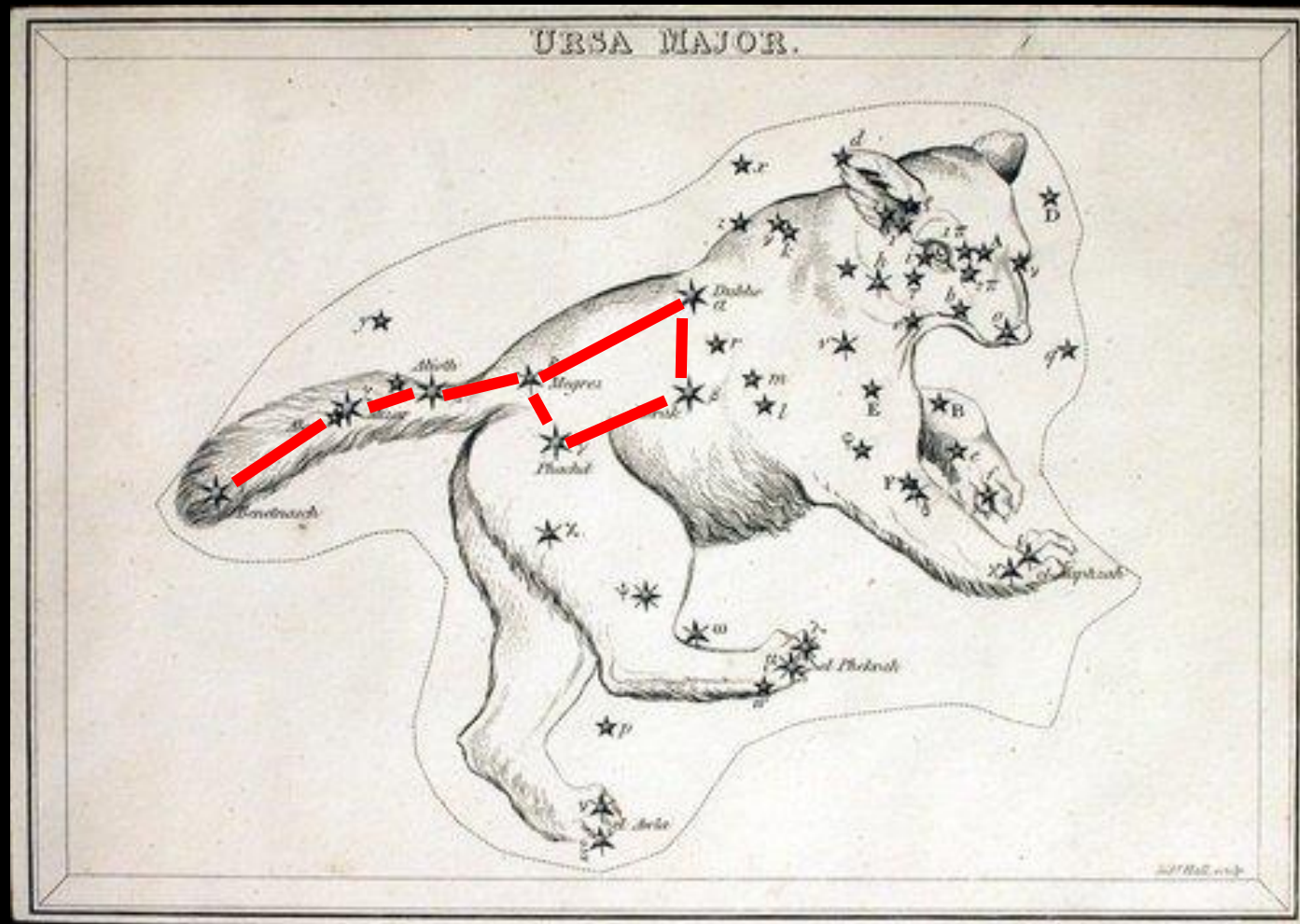
LET'S BACK UP

“Constellations”

- *Recognized* groupings of stars
- 88 total with boundaries (like counties)
- An “address” in the sky
- Other stuff – “asterism”



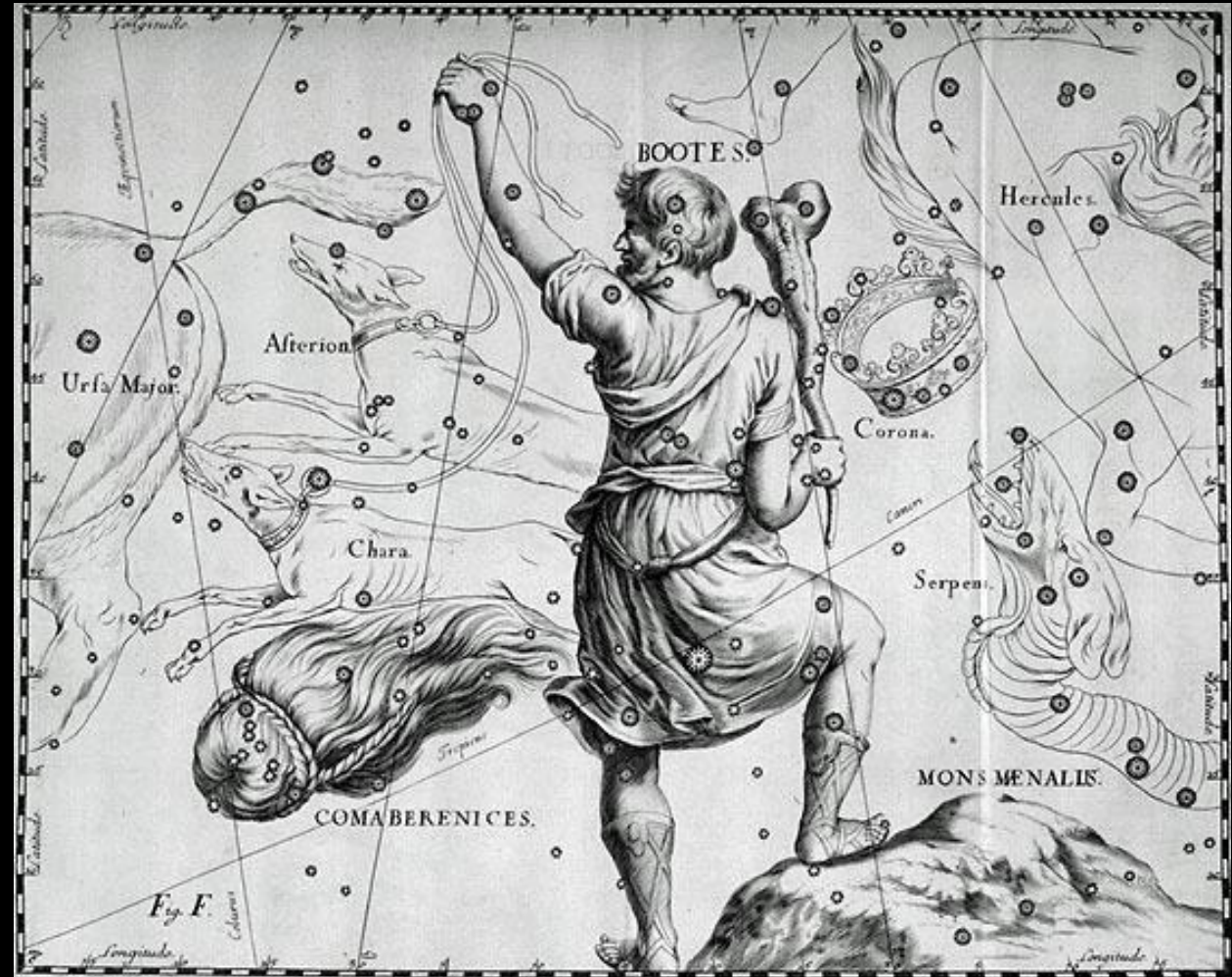




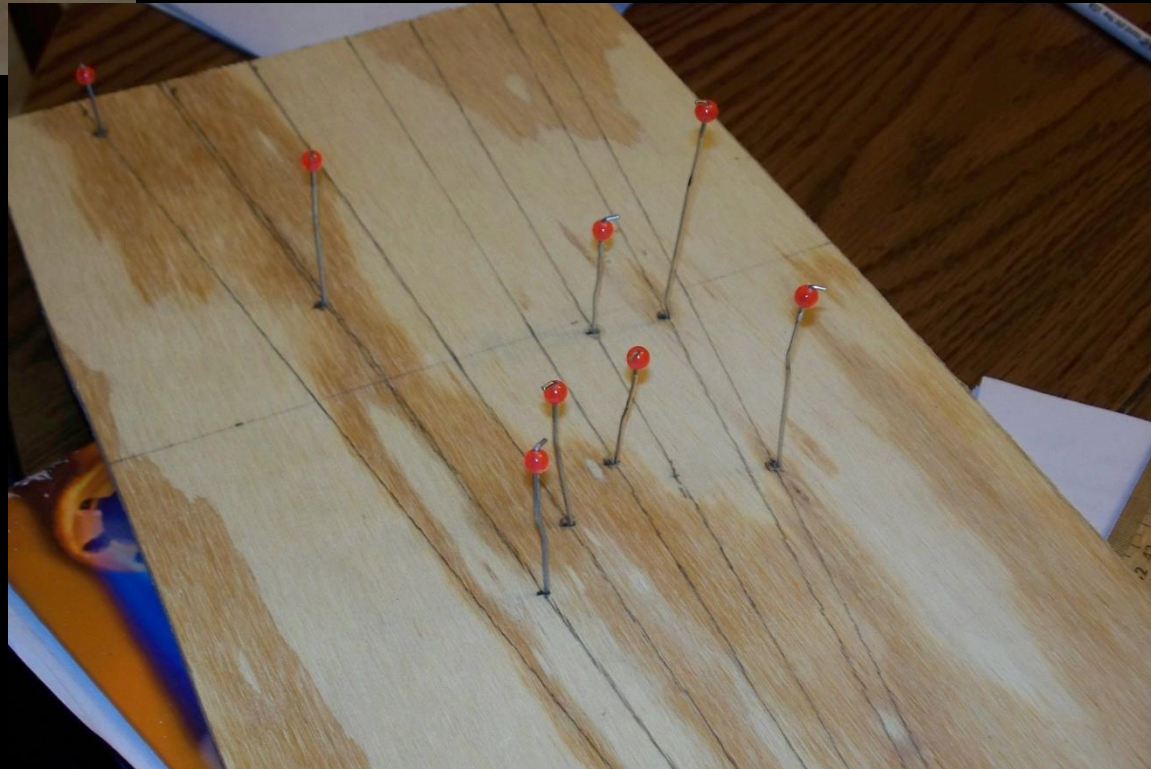
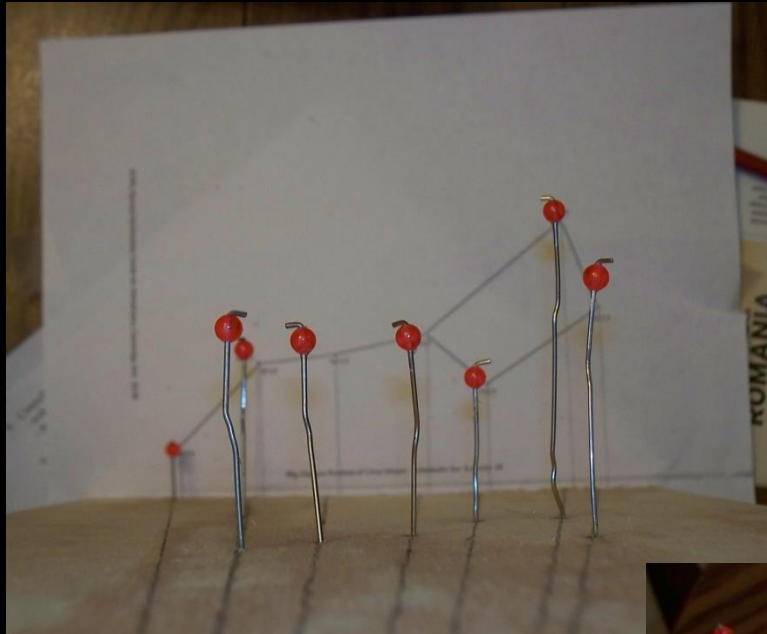
“What the hell is this?”

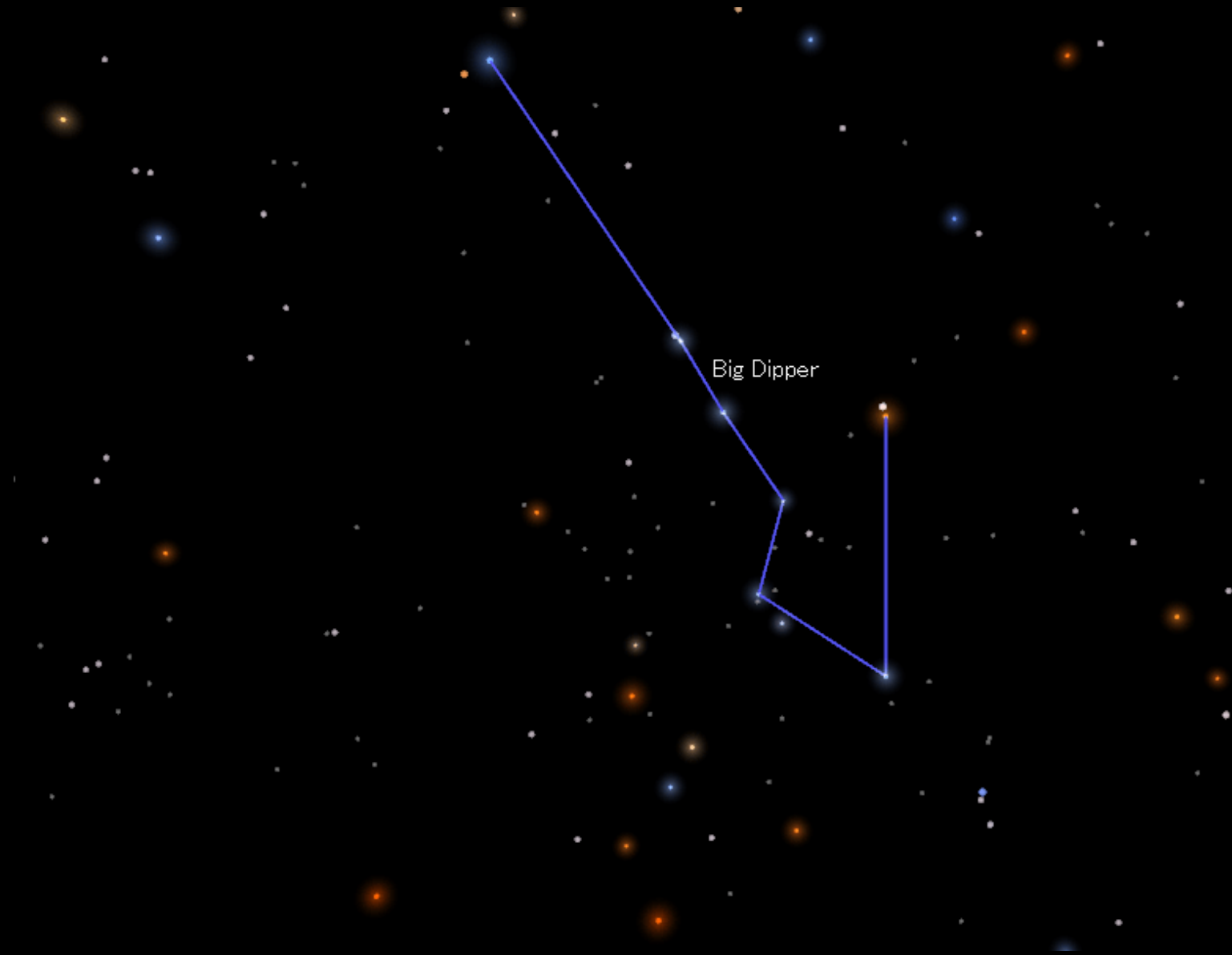
- 28 inanimate objects
- 22 land creatures
- 17 men & women
- 9 birds
- 9 water creatures
- 1 serpent
- 1 insect (a “fly”)
- 1 “head of hair”

88 total!



3D Big Dipper



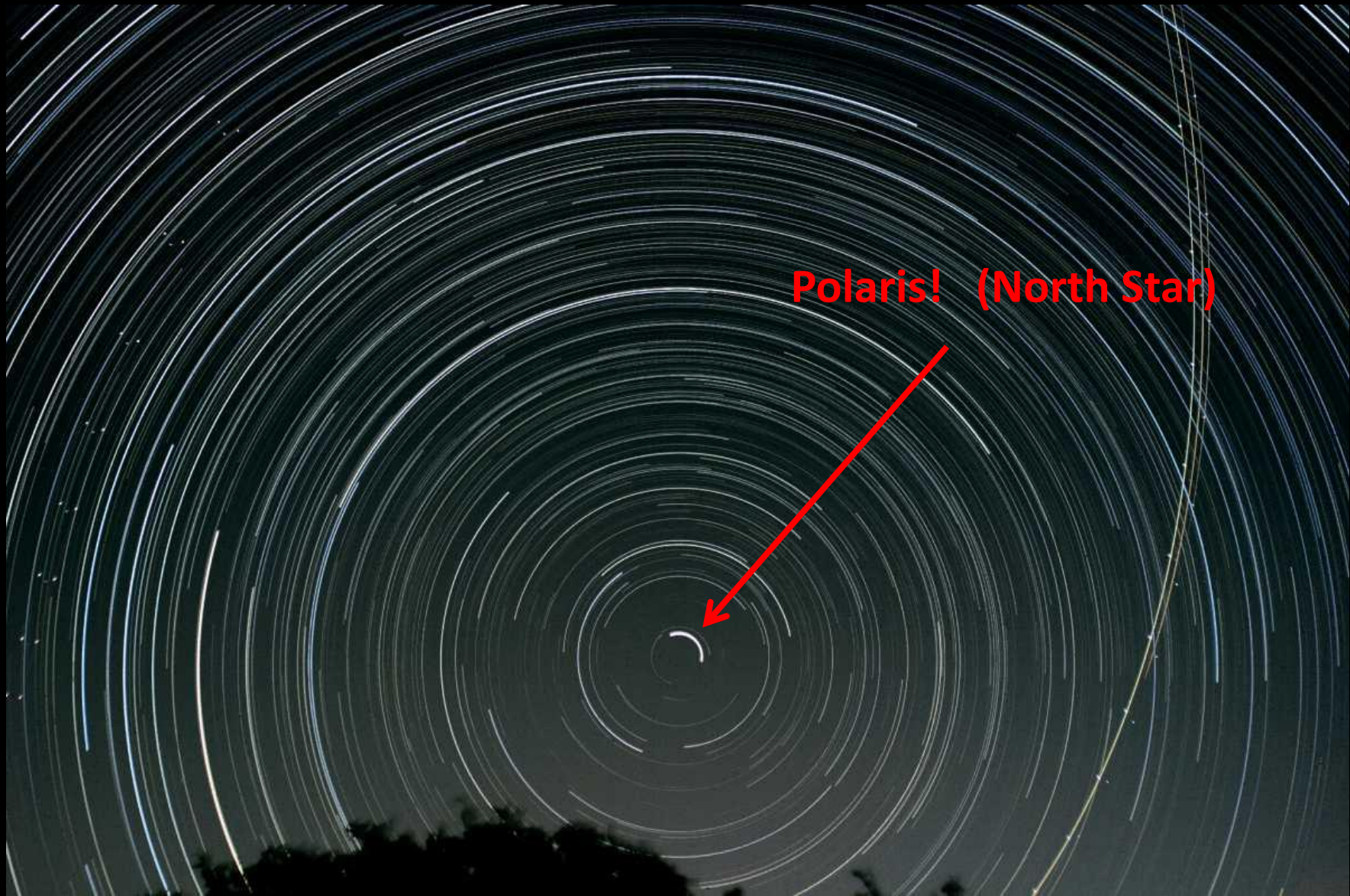


Big Dipper

Proper Motion



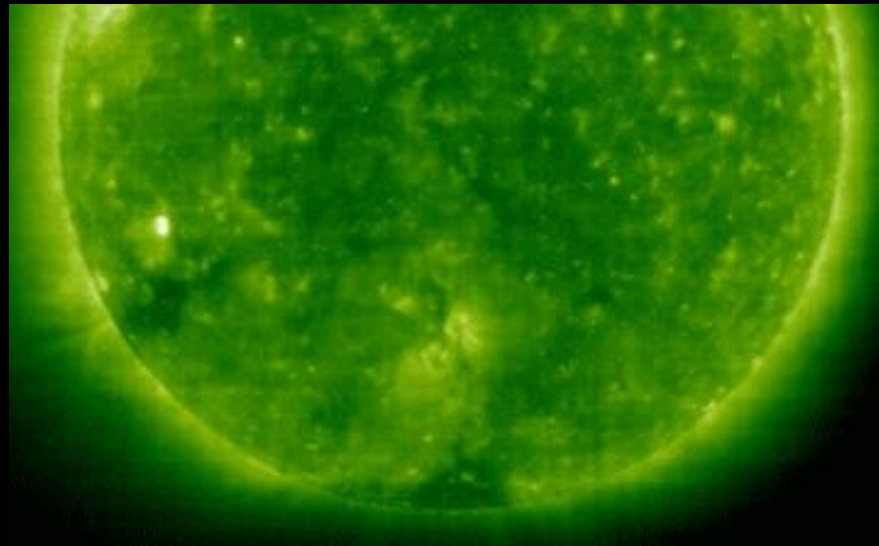
Holy smokes . . .they *MOVE!* Why?



Polaris! (North Star)

“Motions” of the Sun

- Chariot (India, Norse, Greeks)
- Boat (Egypt)
- Flying with wings (Assyrians, Persians)
- On foot with torch (Chumash)

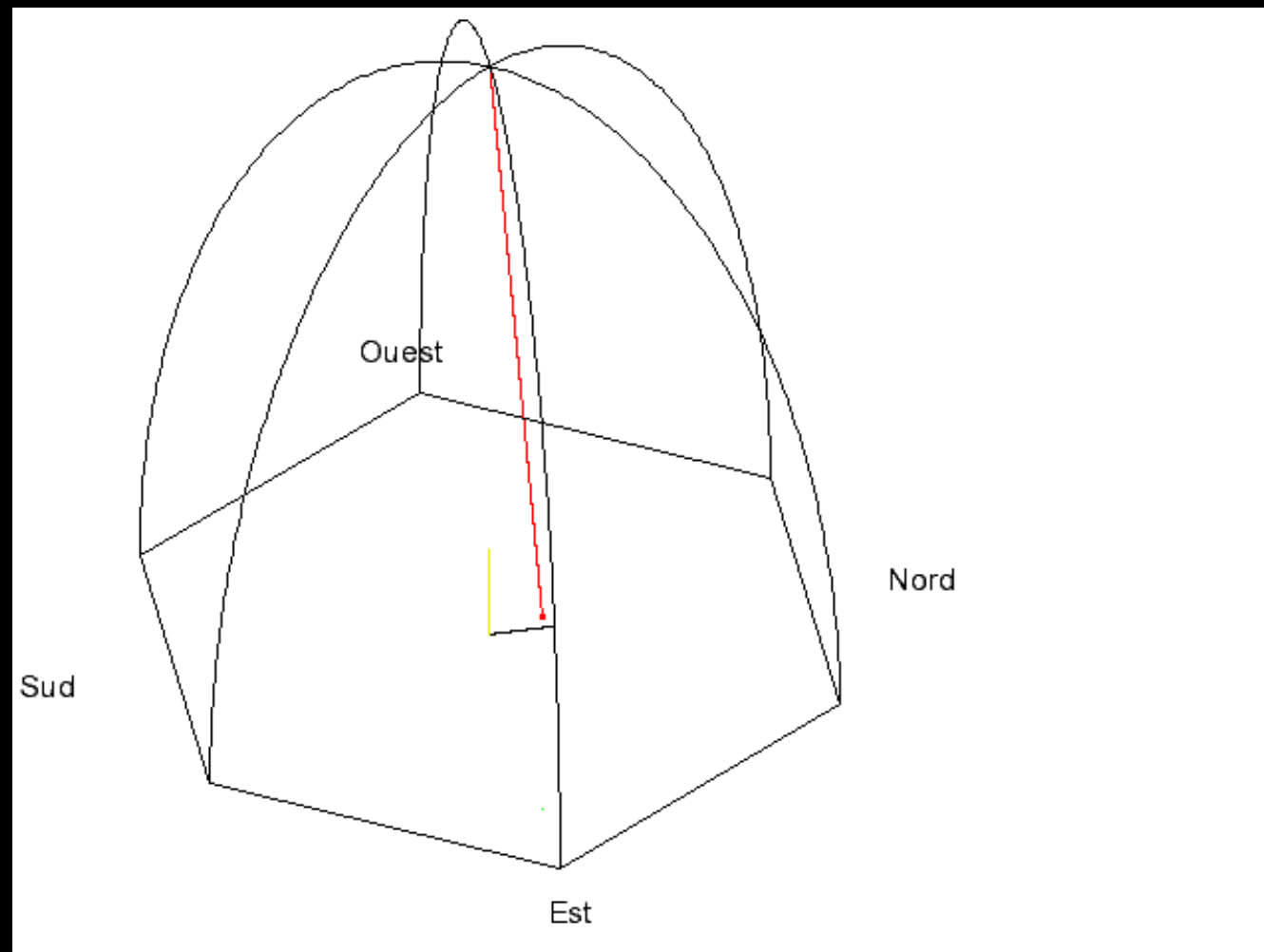




W

E

You want proof?





Zodiac – “circle of animals”

- Originated in Mesopotamia (87 BC)
- Age of Aries, Pisces, then Aquarius (2514 AD)
- “Ecliptic” – *apparent* path of the Sun

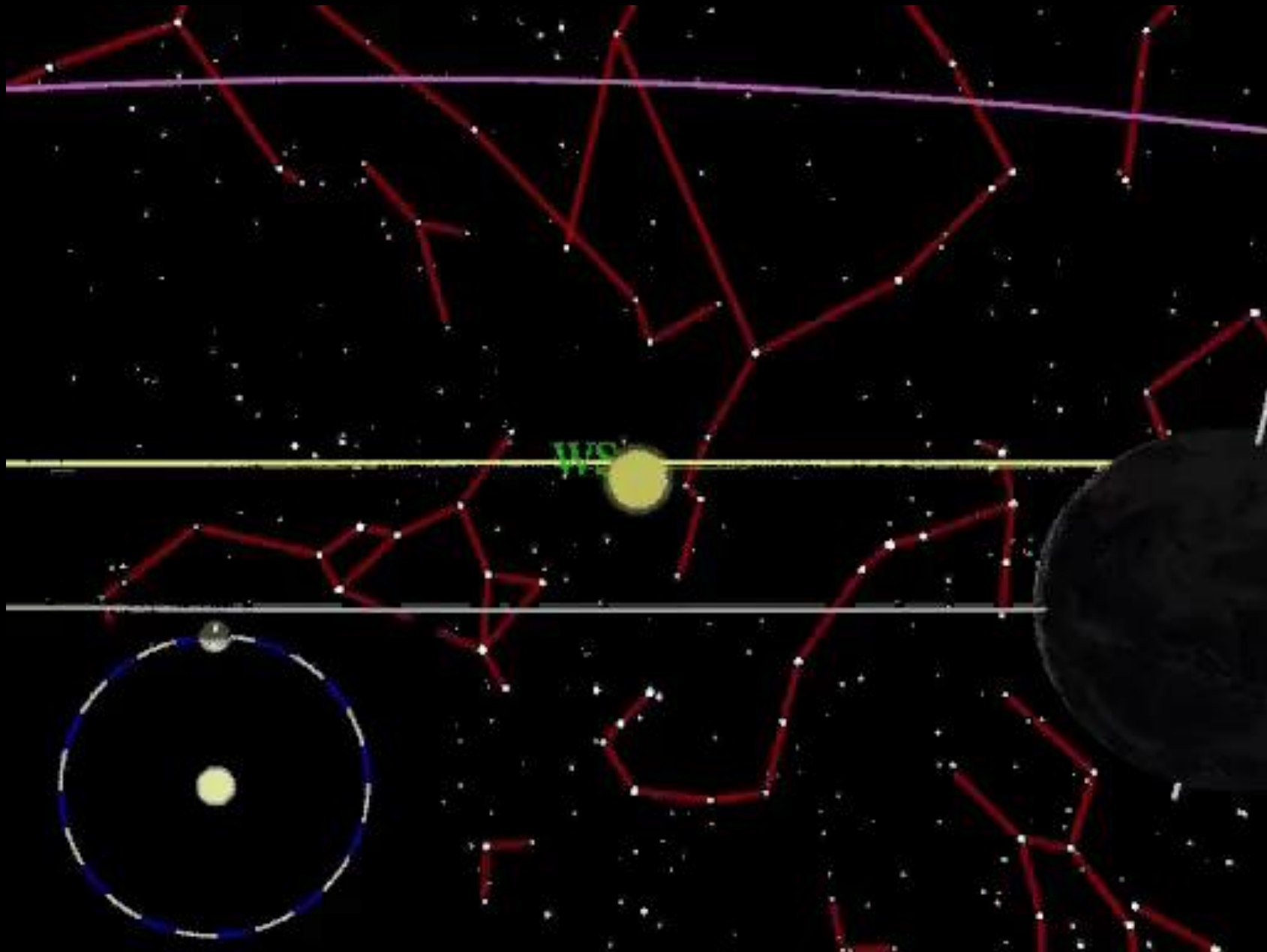




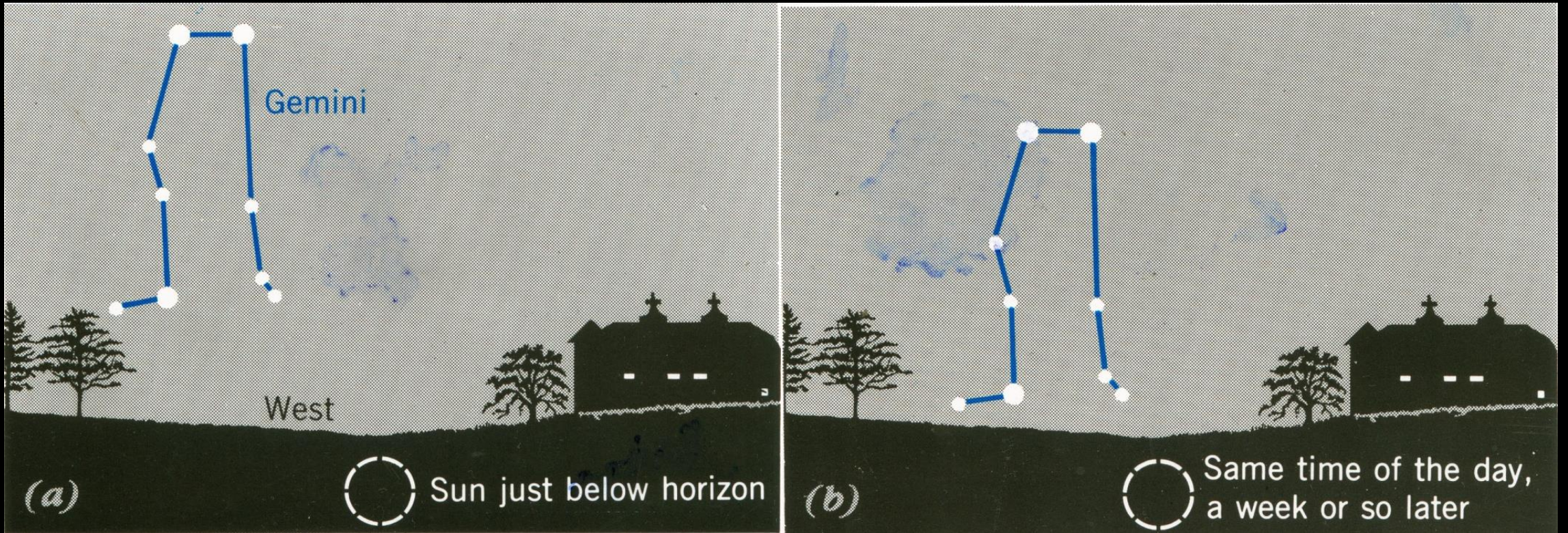
**William M. Staerkel
PLANETARIUM**



66



But how do you know?



Babylonians (3000 BCE)

- “Used” the sky
- Calendar with a 30-day month
- Zodiac
- Number system based on 60
- Sundials to tell time



Greeks (1600 BCE)

- Began to ask “why?”
- Moon shines by reflected light
- Earth spherical (how do we know?)
- Earth stationary



Aristotle (~350 BCE)

- Heavens are perfect & unchanging!
- The circle is divine
- All motion is uniform, like clockwork
- “Geocentrism” – Earth is center of universe
pleasing, eh?)



July 4, 1054 CE

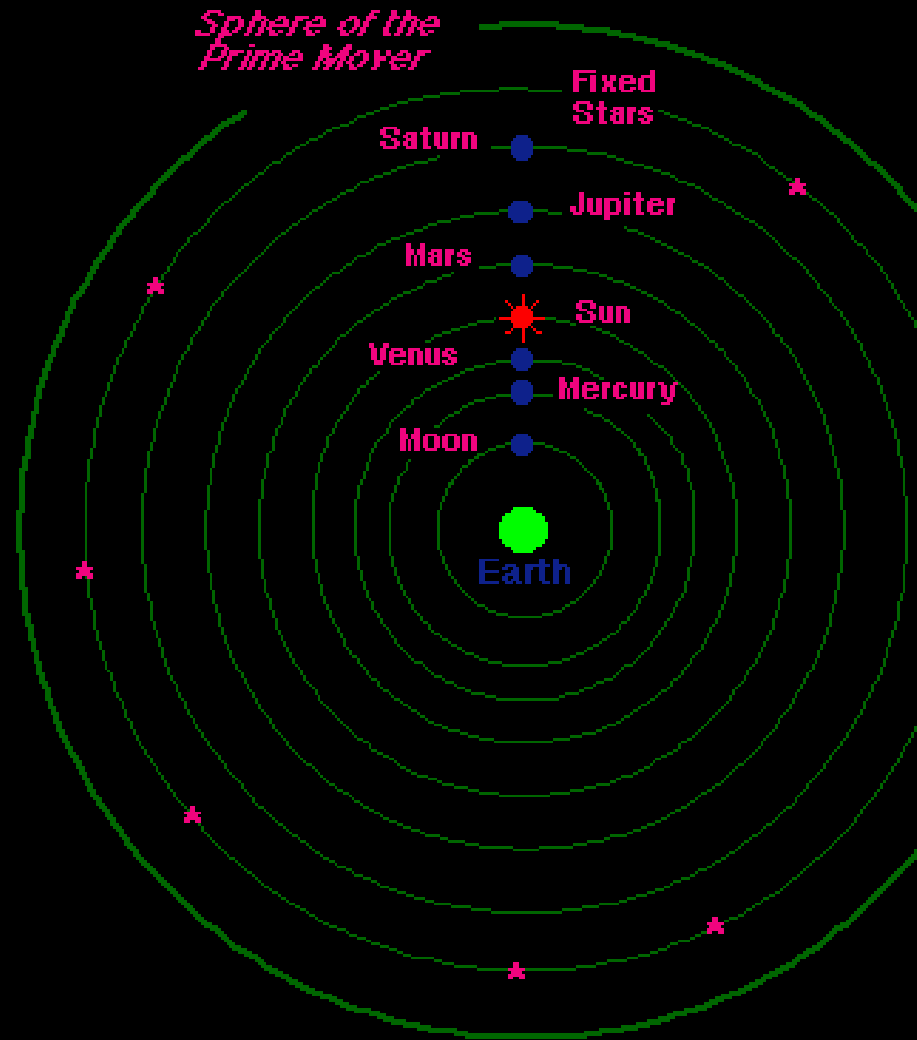


“Wanderers”

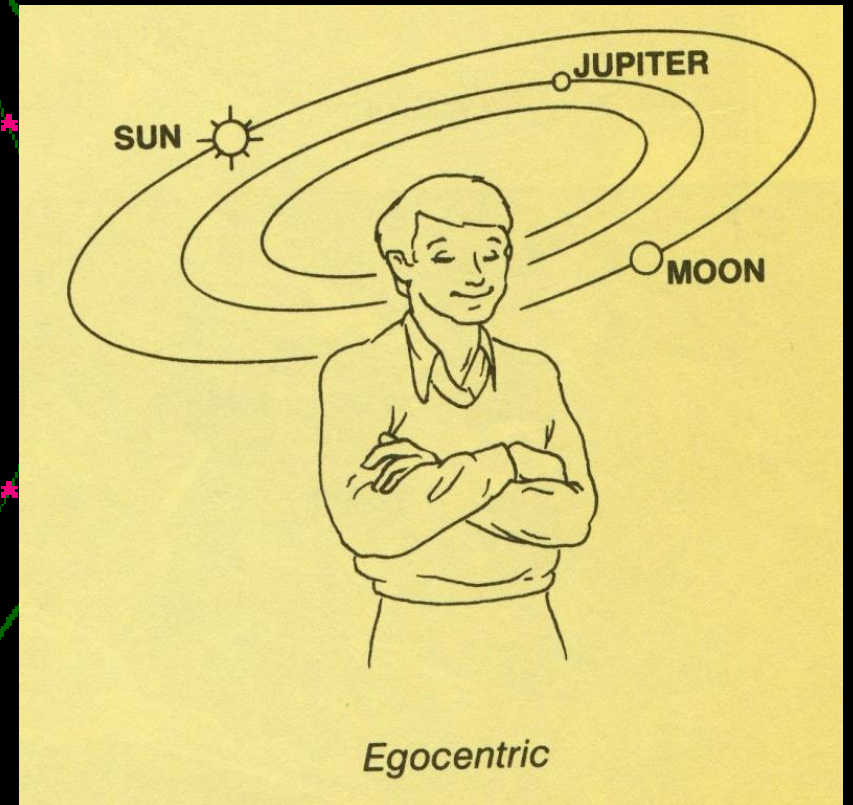
- What are they?
- How many are there?

Planet	Ancient Planet-gods			Modern-day Names		
	Babylonian	Roman	Anglo-Saxon	English	French	Spanish
Sun	Shamash	Sol	Sun	Sunday	<i>dimanche</i>	<i>domingo</i>
Moon	Sin	Luna	Moon	Monday	<i>lundi</i>	<i>lunes</i>
Mars	Nergal	Mars	Tiw	Tuesday	<i>mardi</i>	<i>martes</i>
Mercury	Nabu	Mercurius	Woden	Wednesday	<i>mercredi</i>	<i>miércoles</i>
Jupiter	Marduk	Jupiter	Thor	Thursday	<i>jeudi</i>	<i>jueves</i>
Venus	Ishtar	Venus	Freya	Friday	<i>vendredi</i>	<i>viernes</i>
Saturn	Ninurta	Saturnus	Saturn	Saturday	<i>samedi</i>	<i>sabato</i>

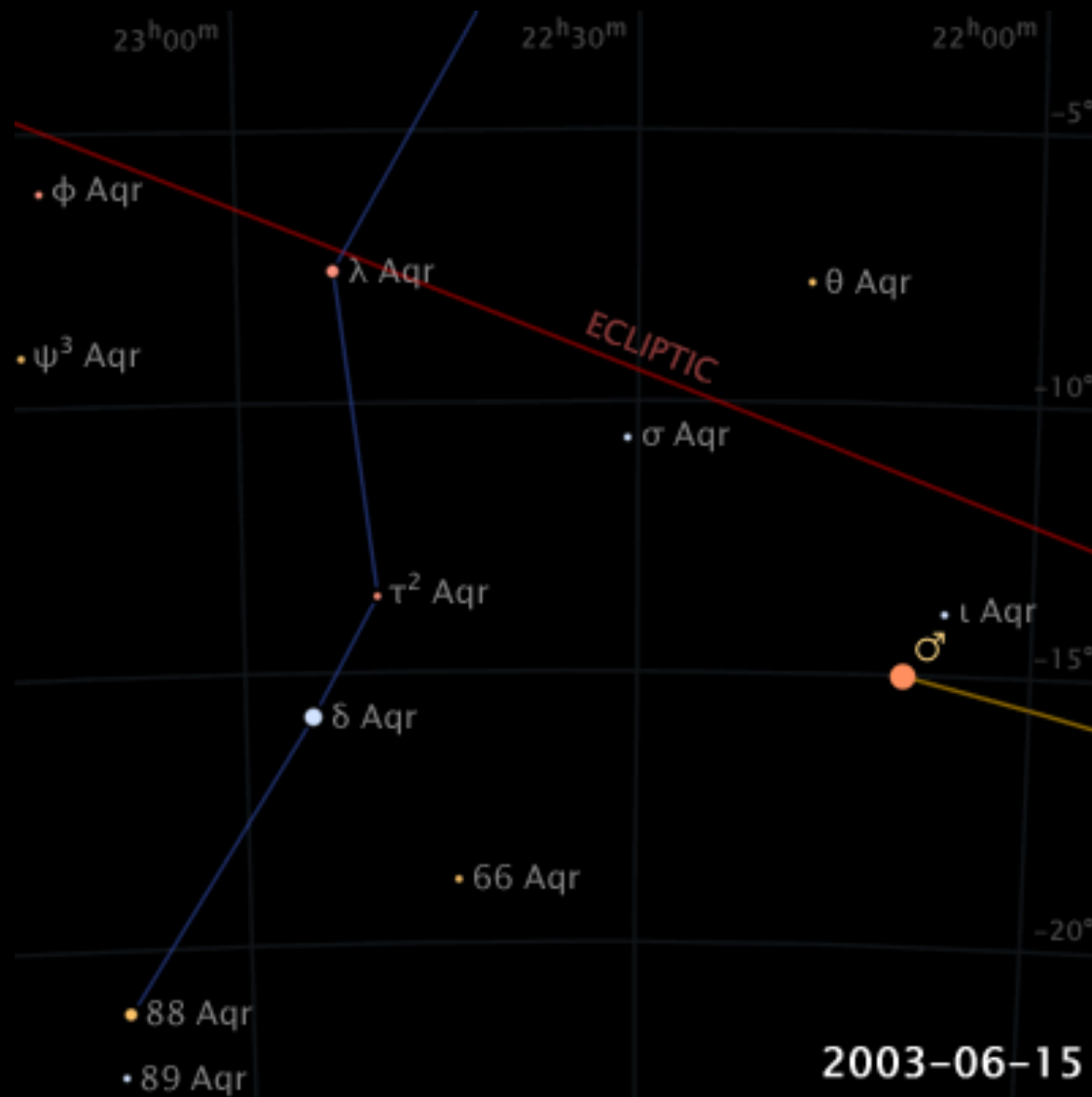
“Geo”centric



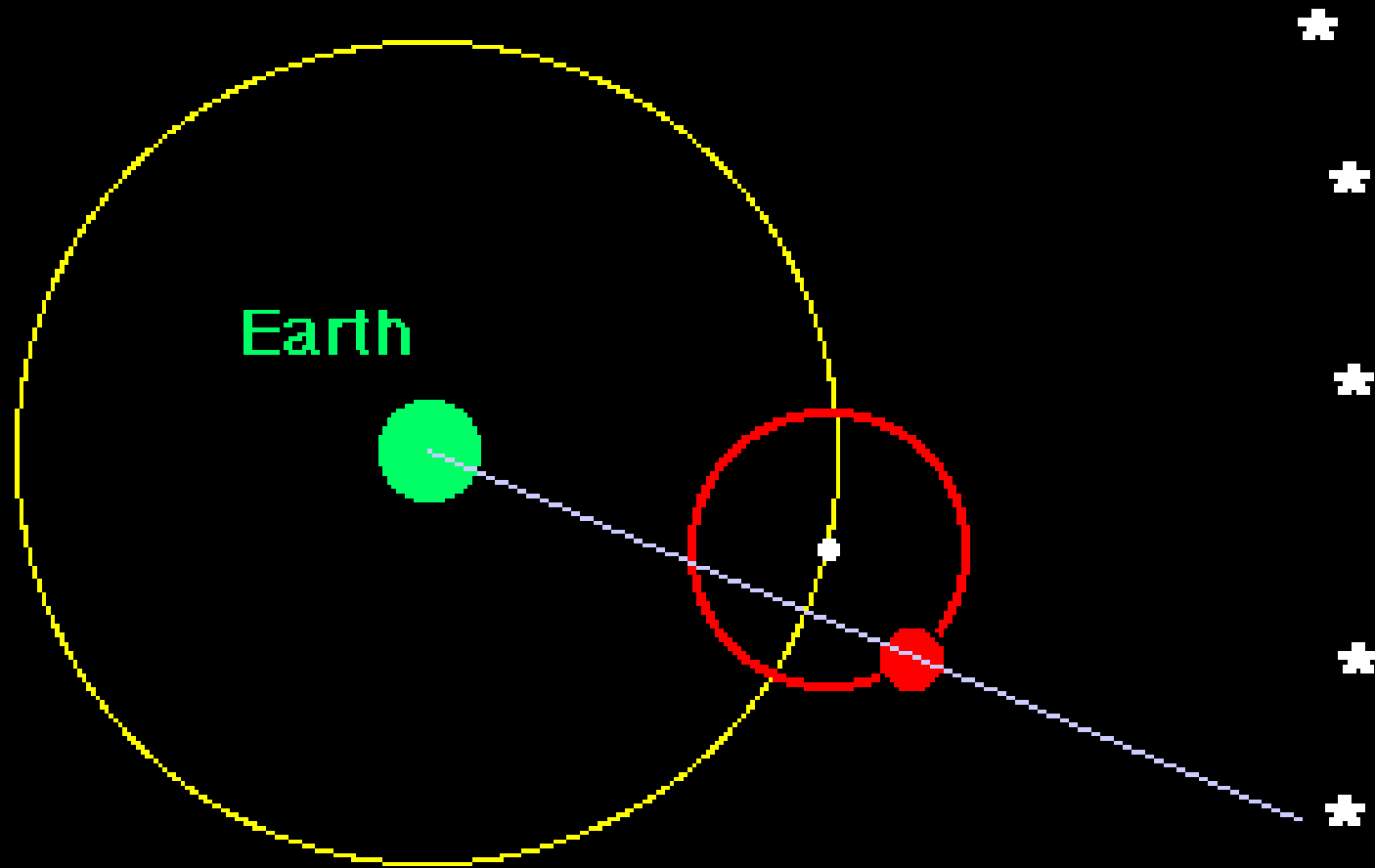
Aristotle's Universe



But wait. . . .



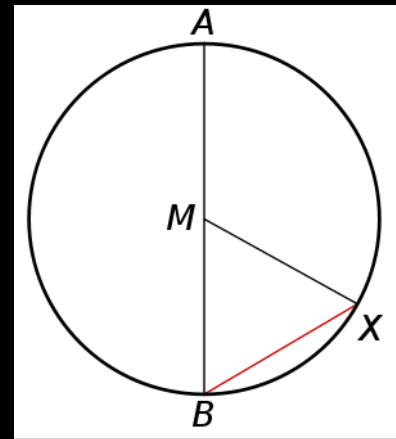
Why stop and reverse?



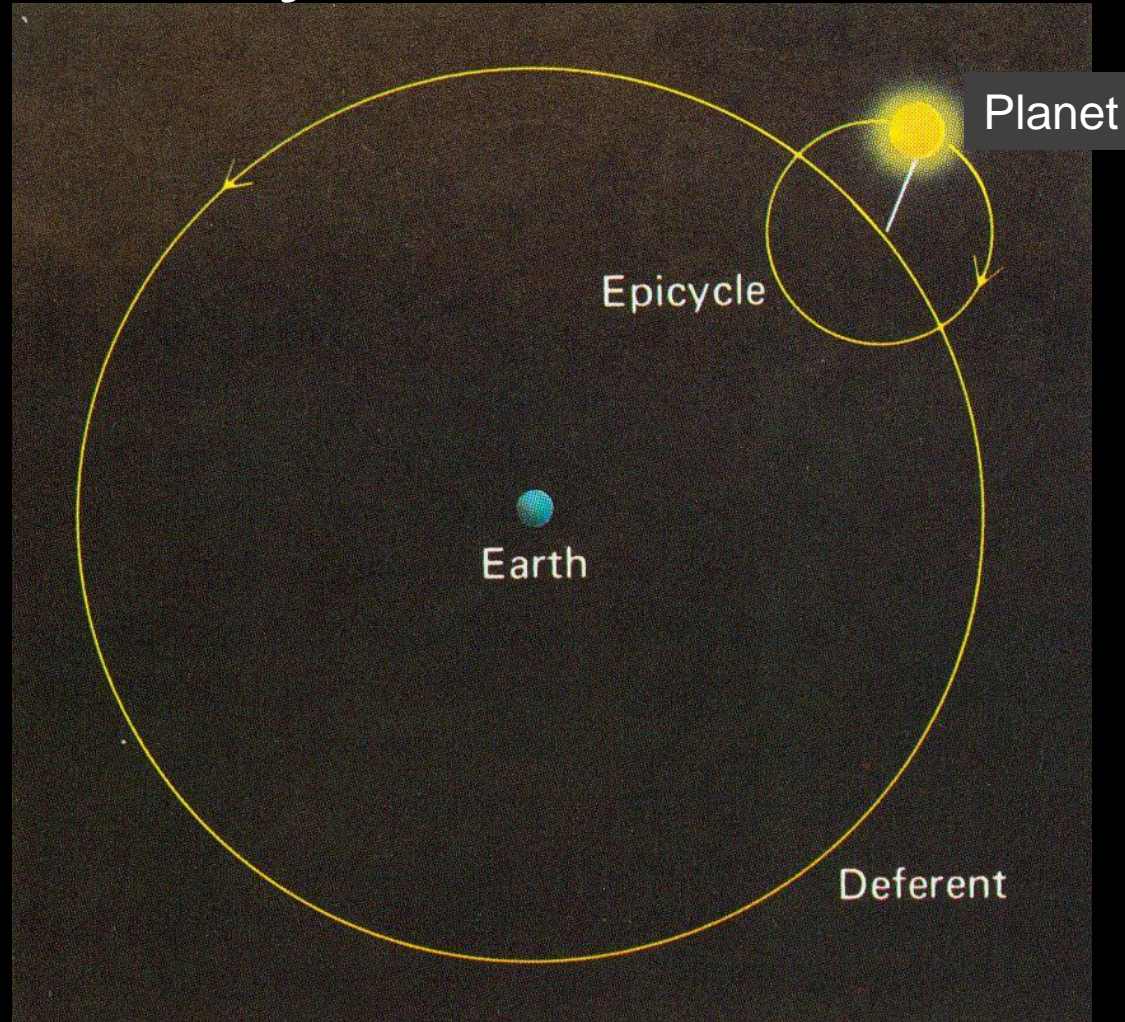


Ptolemy

- 90 – 168 CE
- Greek living in Egypt
- Wrote “The Almagest” (The greatest) ~ 150 CE
- Perfected epicycles
- Spherical geometry (no trig)
- 48 constellations
- 1022 stars in catalog

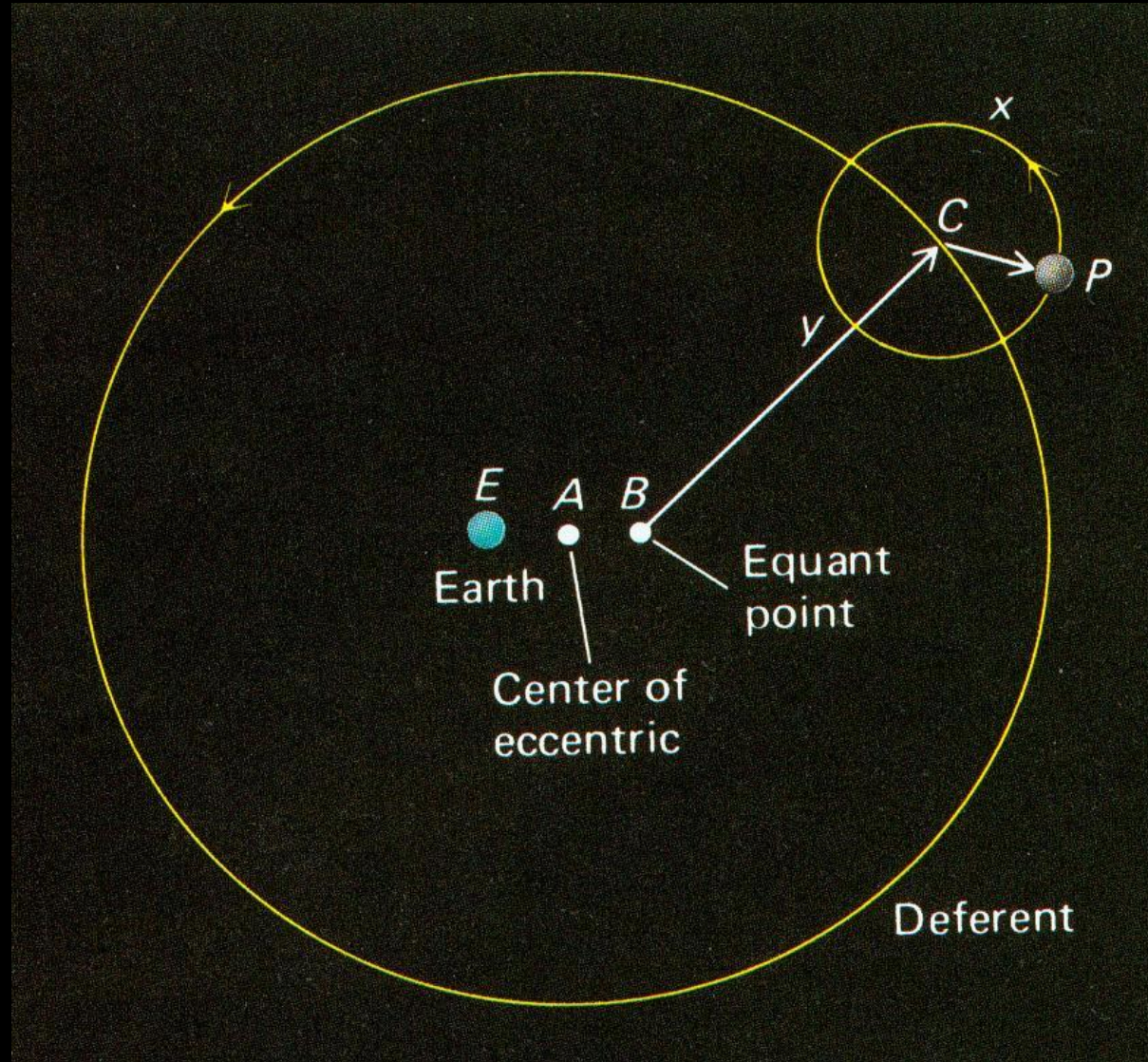


Ptolemy's Geocentric Idea



Seen in [action](#)

“Saving” Uniform motion



Muhammad Ibn Muhammad Ibn al-Hasan al-Tusi

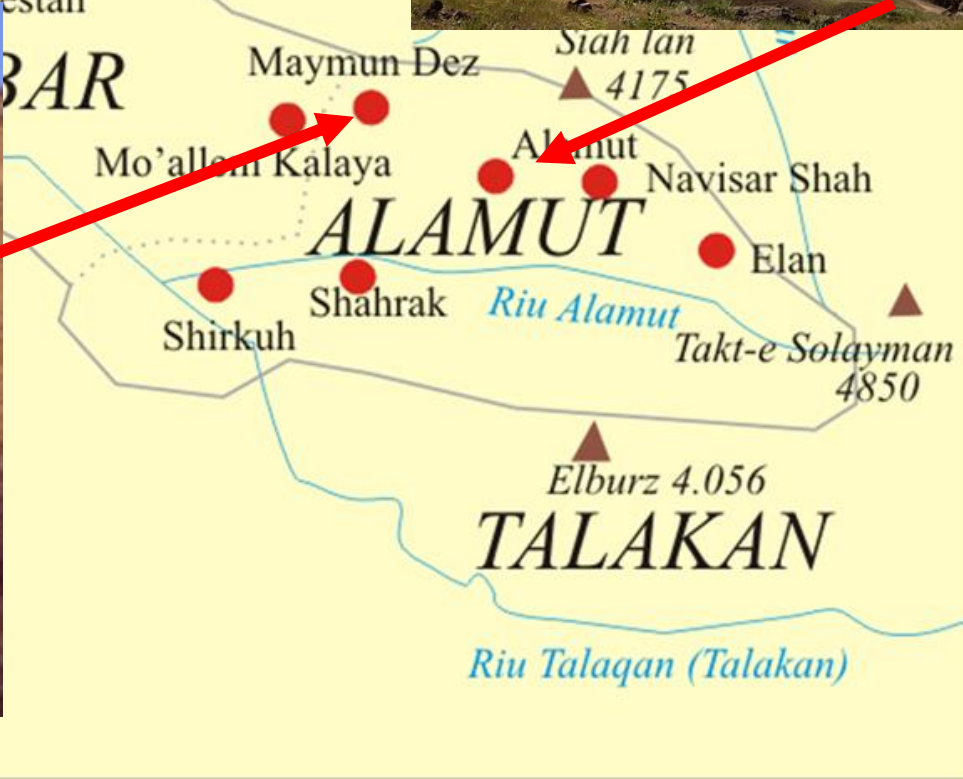
- Born: 1201 in Tus, Persia (northern Iran)
- Lost father at a young age
- Studied theology & “intellectual sciences”
- Took learning very seriously
- Learned natural philosophy from uncle
- Traveled to hear lectures
- Didn't care for Islamic mysticism (“Sufism”)
- Math in Mosul



The Mongol Empire

Tus





Hulago Khan

- Grandson of Genghis Khan
- Siege of Baghdad (1258) – ended “Golden Age of Islam”
- al-Tusi joined Mongols at science advisor
- Convinced Hulago to open an observatory for “astrological” tables



Rasad Khaneh Observatory

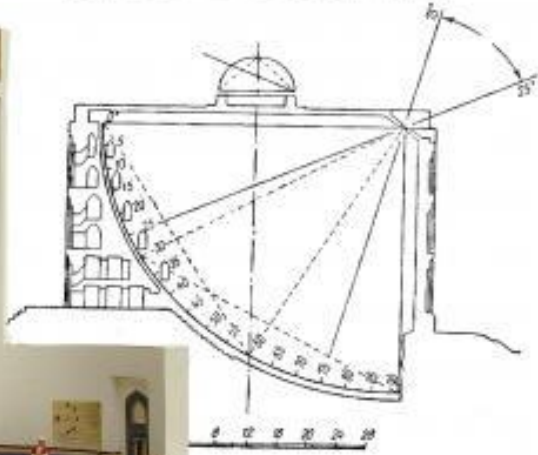
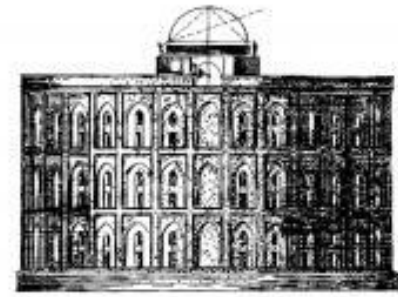
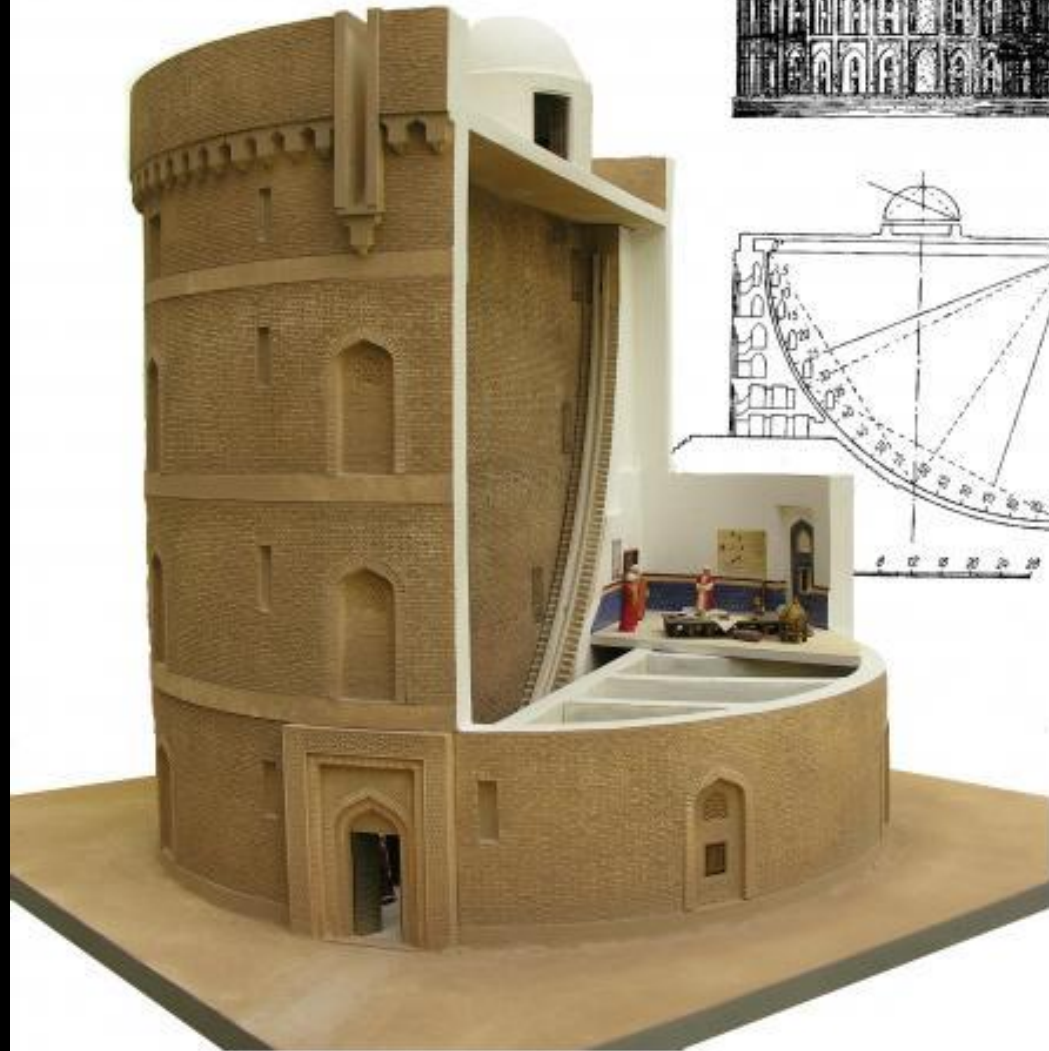




Photo By: Aydin Tabrizi



MadainProject
<https://madainproject.com>







Quadrant – instrument of the day

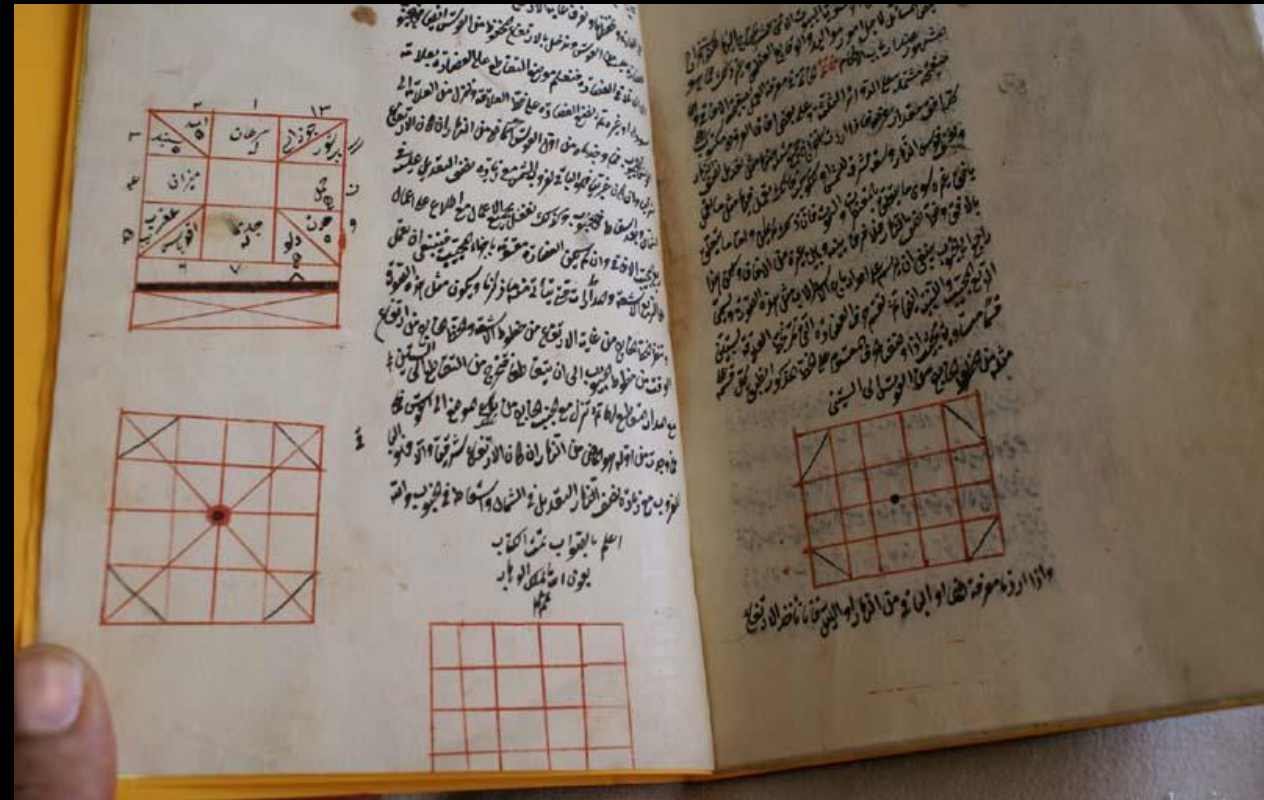






Works

- 150 volumes (25 in Persian, rest in Arabic)
- 5 volumes on trigonometry
- Astronomy
- Ethics

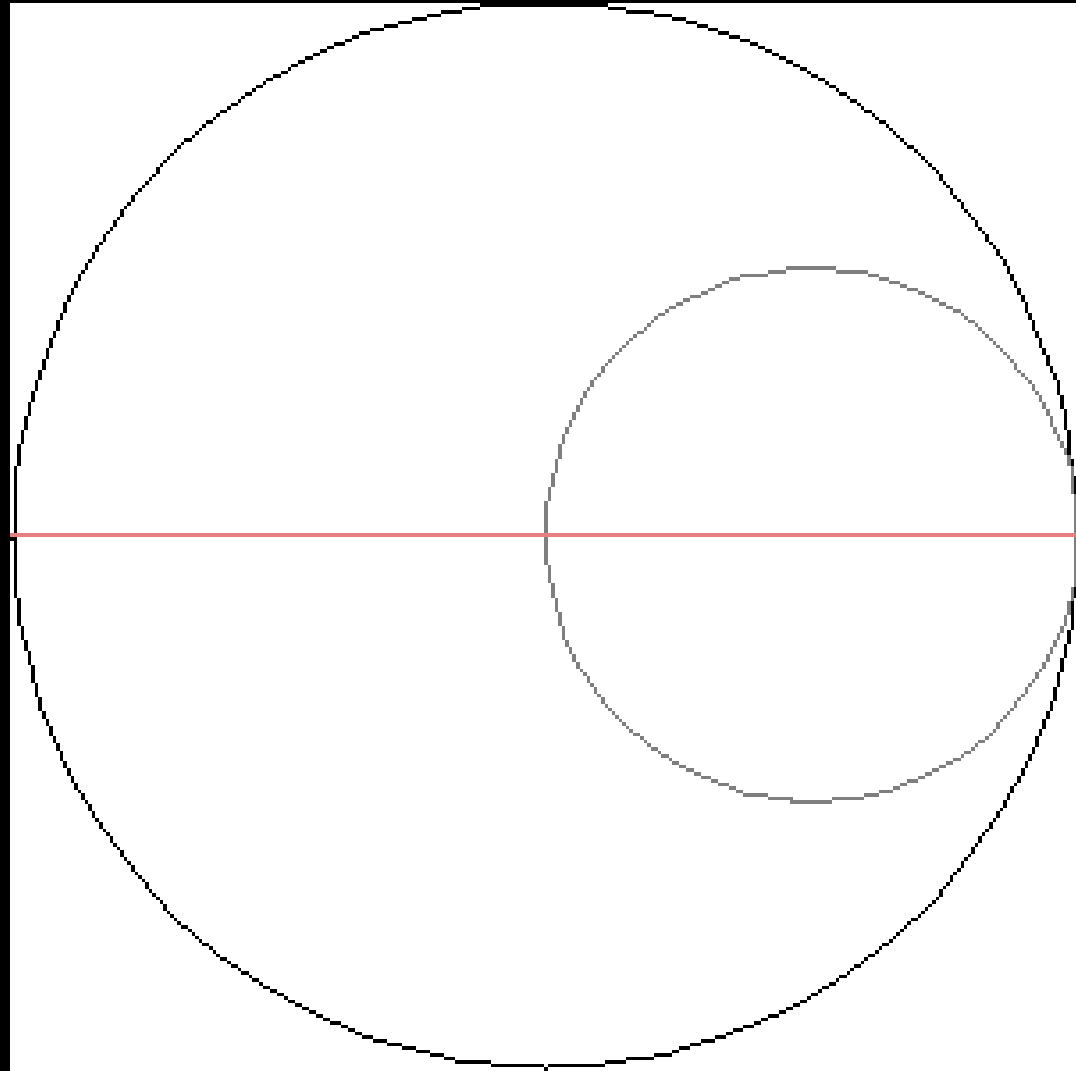


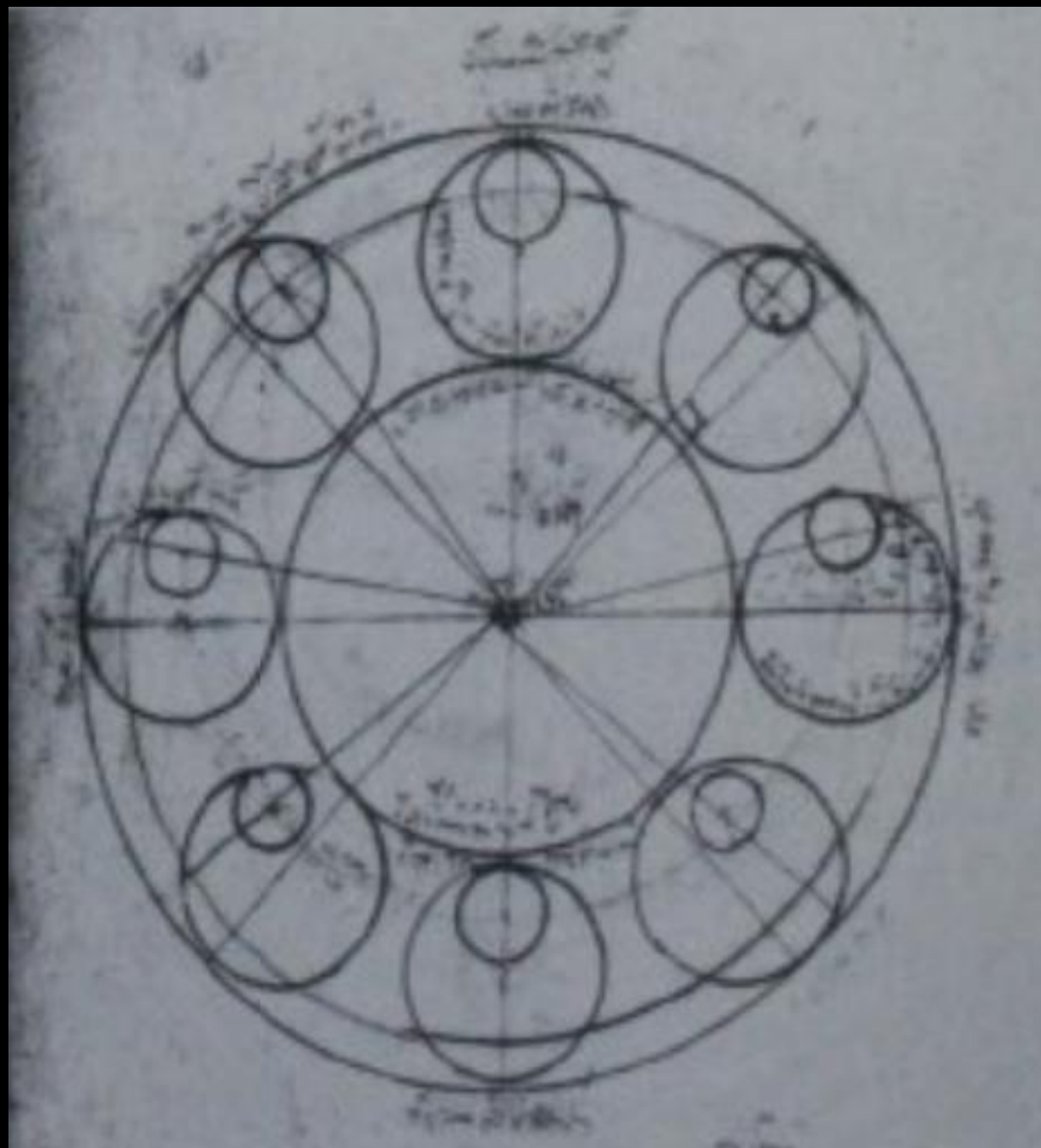
The "Tusi Couple"

صورة الدائرتين في المبداء وللتحرك الصغيرة الى جهة الناظر والكبيرة الى جهة يساره	صورتهما بعد ان قطعت الصغيرة نصفاً والكبيرة ربعاً	صورتهما بعد ان قطعت الصغيرة دورة والكبيرة نصفها	صورتهما بعد ان قطعت الصغيرة دورة ونصفاً والكبيرة بلد ارباع دورة
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النقطة المفروضة

ولبيان ان النقطة لا يزول عن الخط اصلاً وان لم تكن تقصداً يراد البرهان
الهندسة في هذا المحصر فليكن الكبيرة دائرة ABC وقطرها AB ومركزها H



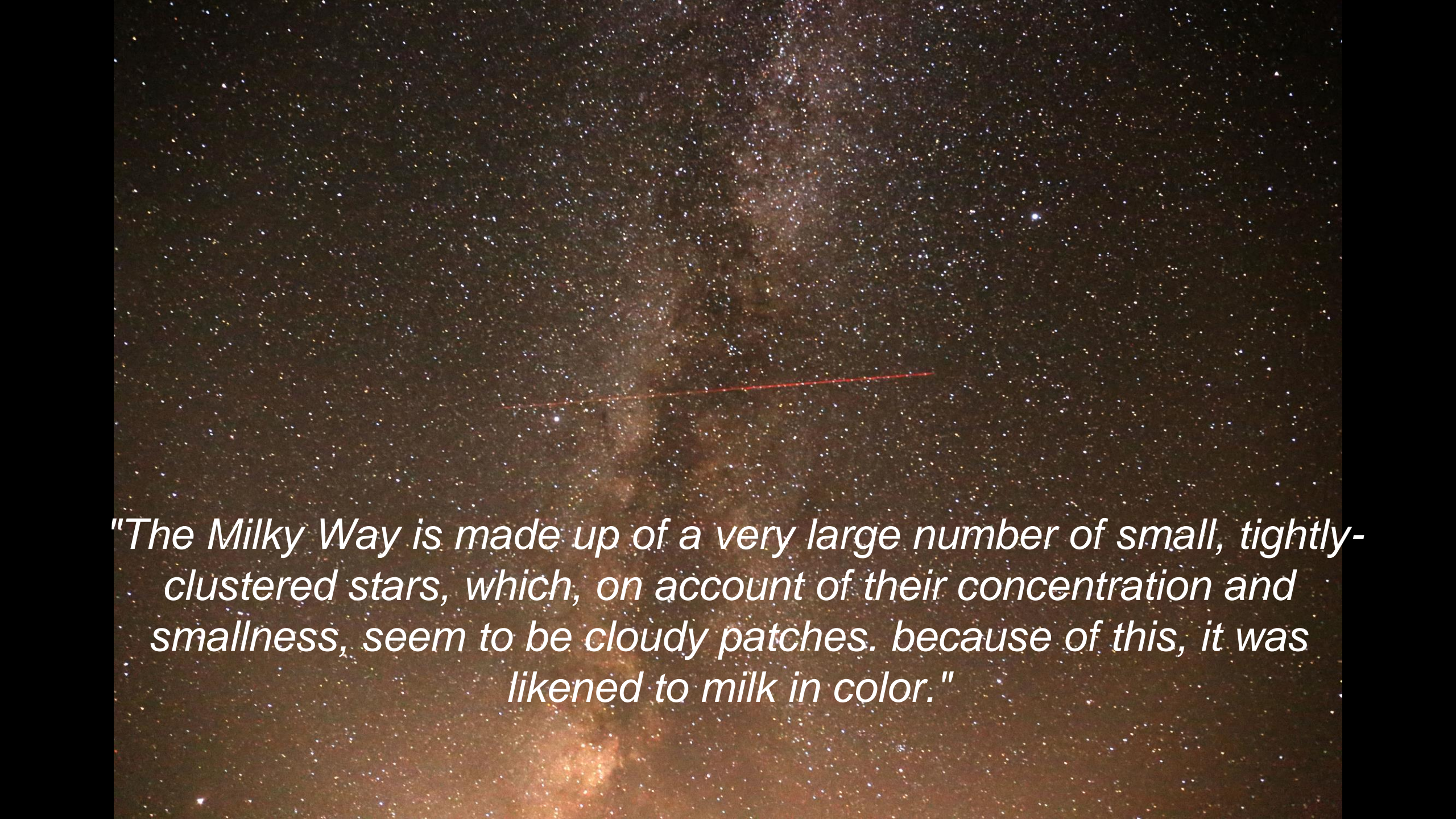


Zij-i Ilkhani tables (1272)

“Table” of
positions

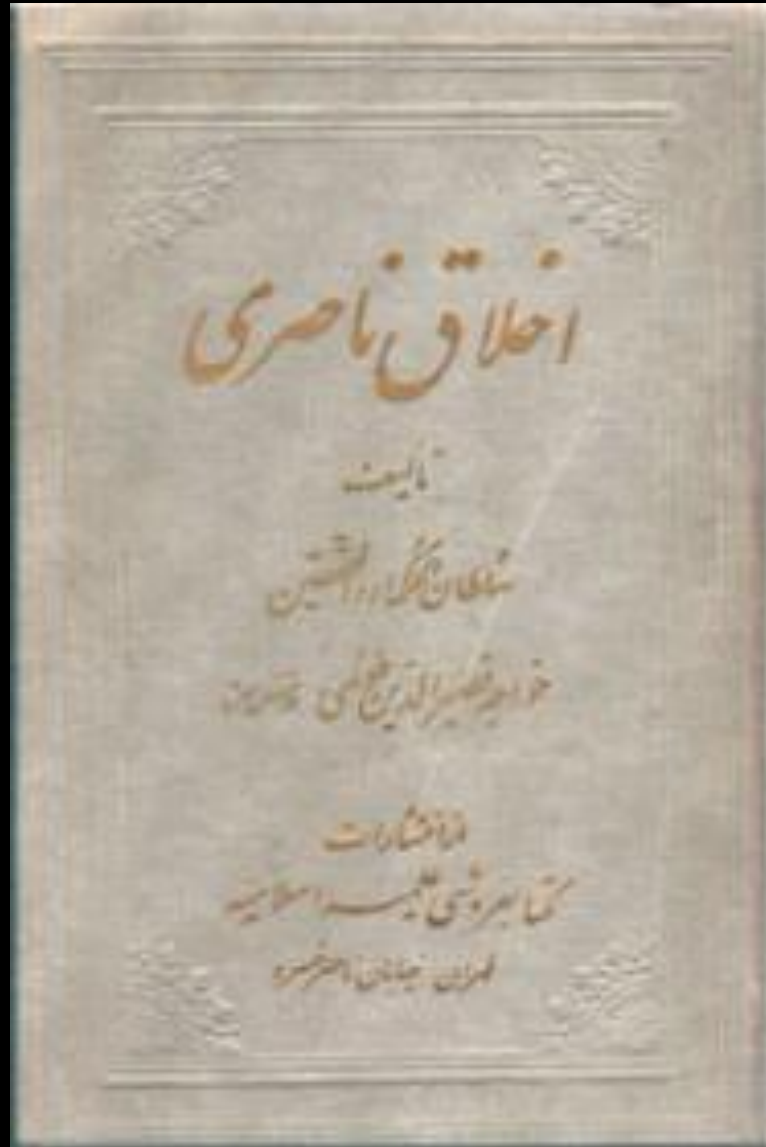
جدول النسب المولفة

العدد	المولفة		البيطان		العدد	النسبة
	الاولى	الثانية	الاولى	الثانية		
١	١	١	١	١	١	١
٢	١	١	١	١	١	١
٣	١	١	١	١	١	١
٤	١	١	١	١	١	١
٥	١	١	١	١	١	١
٦	١	١	١	١	١	١
٧	١	١	١	١	١	١
٨	١	١	١	١	١	١
٩	١	١	١	١	١	١
١٠	١	١	١	١	١	١
١١	١	١	١	١	١	١
١٢	١	١	١	١	١	١
١٣	١	١	١	١	١	١
١٤	١	١	١	١	١	١
١٥	١	١	١	١	١	١
١٦	١	١	١	١	١	١
١٧	١	١	١	١	١	١
١٨	١	١	١	١	١	١
١٩	١	١	١	١	١	١
٢٠	١	١	١	١	١	١



"The Milky Way is made up of a very large number of small, tightly-clustered stars, which, on account of their concentration and smallness, seem to be cloudy patches. because of this, it was likened to milk in color."

Akhlaq-i-Nasiri



اخلاق ناصری

تالیف

شیخ محمد غزالی

مترجم: سید محمد رفیع

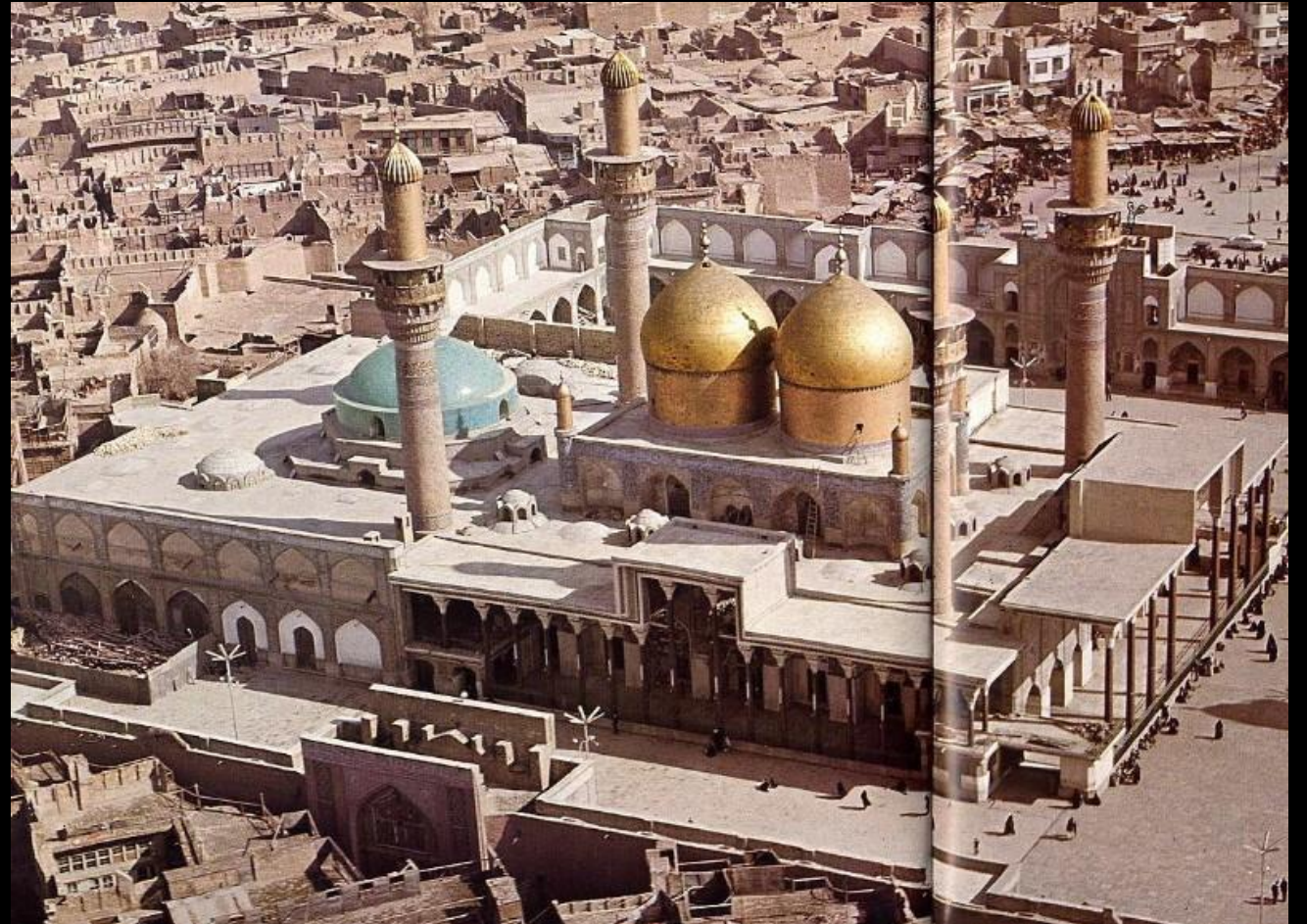
مطبعات

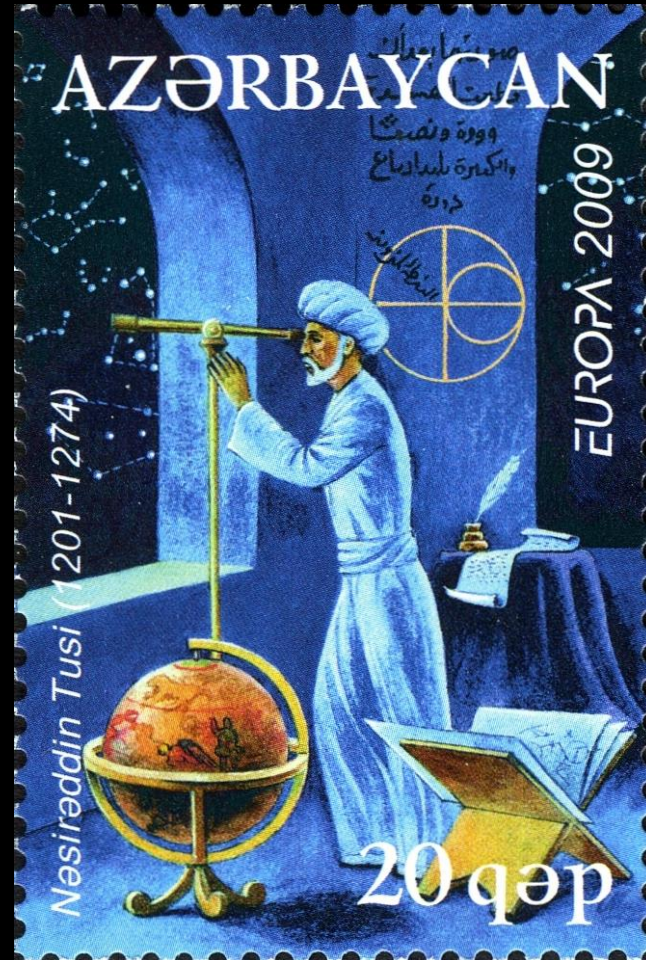
کتاب پرسی

کراچی

Died June, 1274 (age73)

- Tomb in Al-Kadhimiya Mosque in Baghdad
- Crater on the Moon
- Asteroid
- The K. N. Toosi University Technology in Iran
- “Engineer’s Day” in Iran





Shamakhy Astrophysical Observatory

Islamic months

Muharram محرّم (or Muḥarram al Ḥaram)

Safar صفر (or Ṣafar al Muzaffar)

Rabi' al-awwal ربيع الأول (Rabī' I)

Rabi' al-thani ربيع الثاني (or Rabī' al Thānī, or Rabī' al-Akhir) (Rabī' II)

الأخر أو ربيع الثاني

Jumada al-awwal جمادى الأولى (Jumādā I)

Jumada al-thani جمادى الآخر أو (or Jumādā al-akhir) (Jumādā II)

جمادى الثاني

Rajab رجب (or Rajab al Murajab)

Sha'aban شعبان (or Sha'abān al Moazam)

Ramadan رمضان (or Ramzān, long form: Ramaḍān al Mubarak)

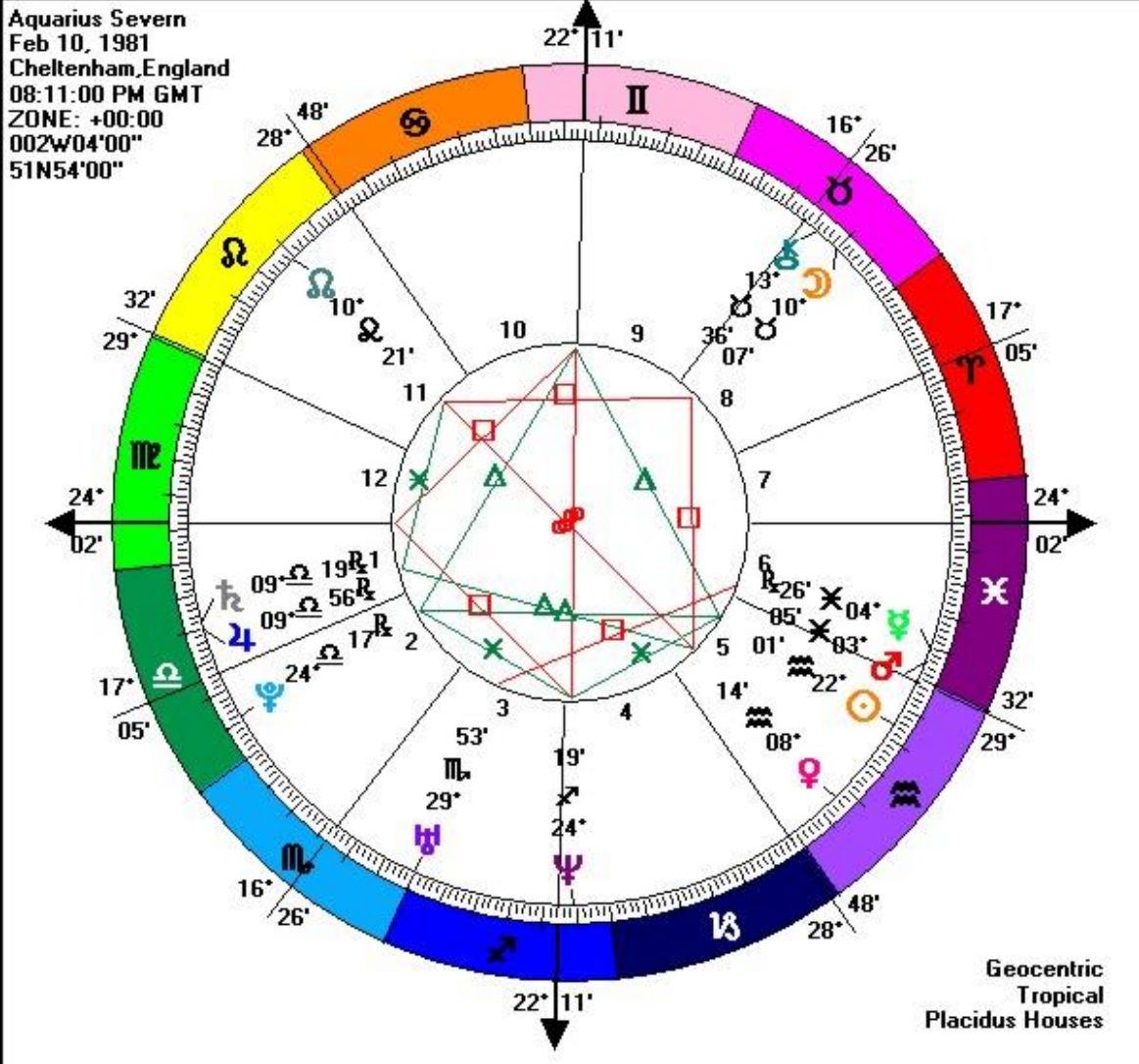
Shawwal شوال (or Shawwal al Mukarram)

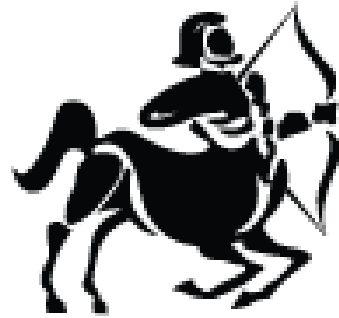
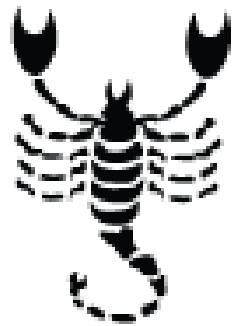
Dhu al-Qi'dah ذو القعدة

Dhu al-Hijjah ذو الحجة



Modern "astrology"





YOUR HOROSCOPE

Your birthday Tuesday. If you're alert and enterprising in the year ahead, you'll have an excellent chance at finding a second source of income that will blend compatibly with your present mode of earning.

Gemini (May 21-June 20) A difficult objective can be achieved today, but you may rationalize otherwise and not put forth the effort necessary to come out victorious. You'll never know until you try.

Cancer (June 21-July 22) If you don't practice what you preach today, others won't be interested in your philosophy or suggestions. It's the example that counts.

Leo (July 23-Aug. 22) It behooves you to be money- and/or commercially-minded today; there's a possibility you could turn a profit from a source other than your usual one. Keep your eyes open.

Virgo (Aug. 23-Sept. 22) If you show a willingness to cooperate today, people with whom you'll be involved will do the same. This is

a good starting point for pleasant associations.

Libra (Sept. 23-Oct. 23) In order to gratify your inner urges today, it's important that you get involved in something you deem to be constructive and worthwhile. Work must have value.

Scorpio (Oct. 24-Nov 10) Generally speaking, this should be a rather enjoyable day for you. Something you thought might cause you complications is not likely to manifest itself.

Ophiuchus (Nov. 10-Dec. 5) You will start World War III by accident, and, what's worse, your feet stink beyond belief. Don't believe everything you read!

Sagittarius (Dec. 5-Dec. 21) Conditions are basically favorable today, and you should take advantage of these trends. Be sure to finalize to your satisfaction any projects you begin.

Capricorn (Dec. 22-Jan. 19) You could need a variety of activities to keep you happy today. Don't be afraid to take on several assign-

ments, because this is one of those rare times when more is better.

Aquarius (Jan. 20-Feb. 19) Your possibilities for personal gain look more encouraging today than they may look tomorrow. Don't leave any loose threads dangling so you can trip over them later.

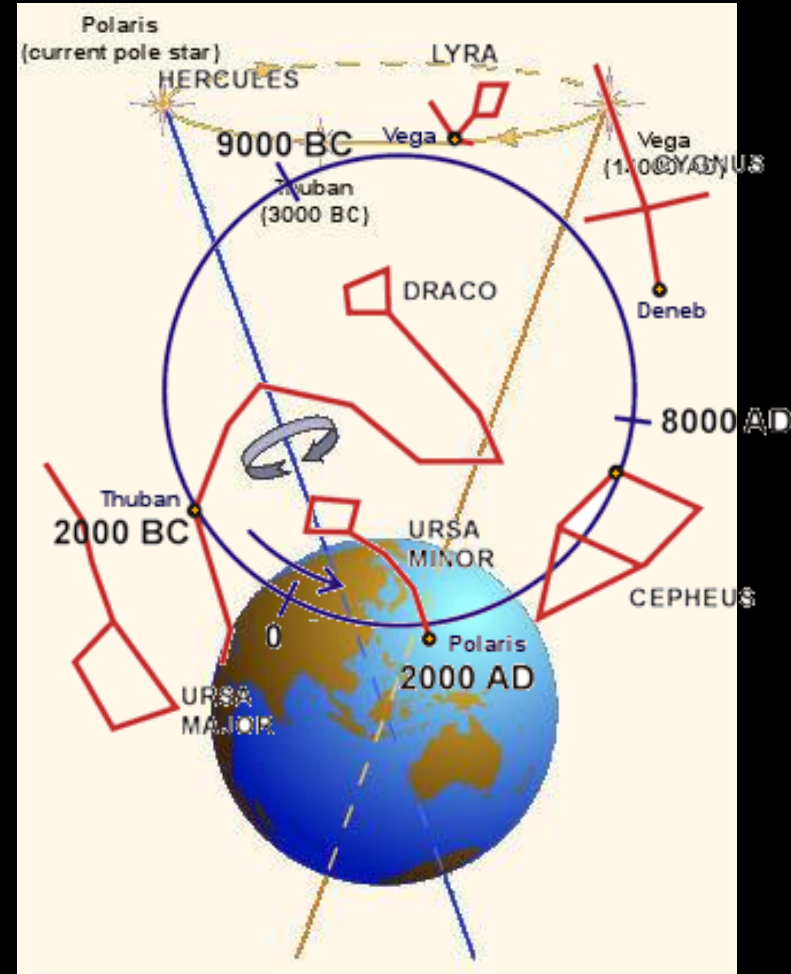
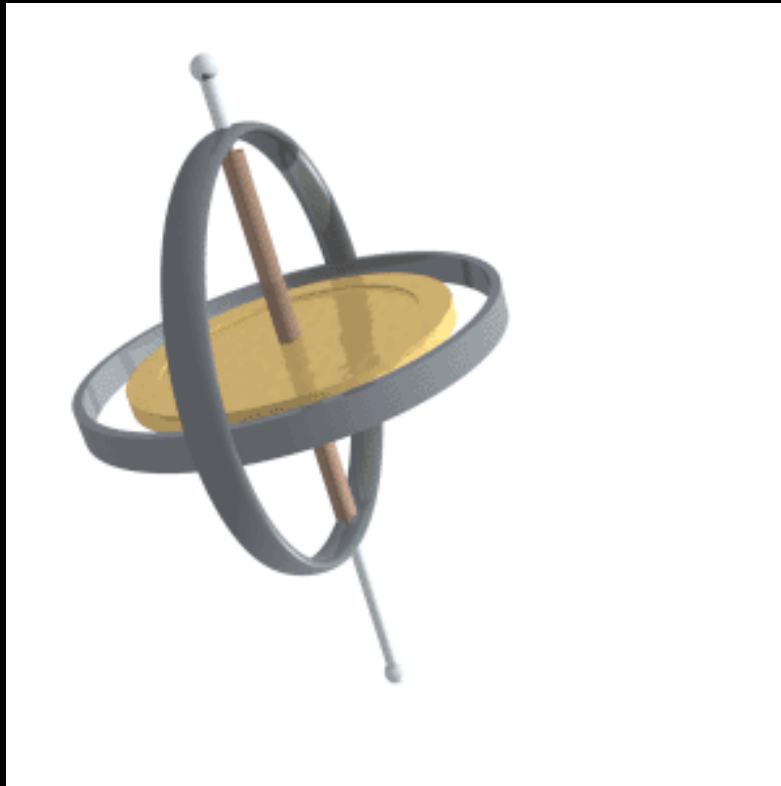
Pisces (Feb. 20-March 20) What you hope to accomplish can be achieved today, provided you are self-reliant and independent. Have complete faith in your own capabilities.

Aries (March 21-April 19) Your perceptions could provide you with valuable information today that can't be derived through a process of logical reasoning. To be successful, though, use both.

Taurus (April 20-May 20) Make your own determinations today regarding someone new you may meet. The fact that this individual doesn't get along too well with one of your friends shouldn't affect your evaluations.

Show em on Stellarium!

Another motion . . . Precession!



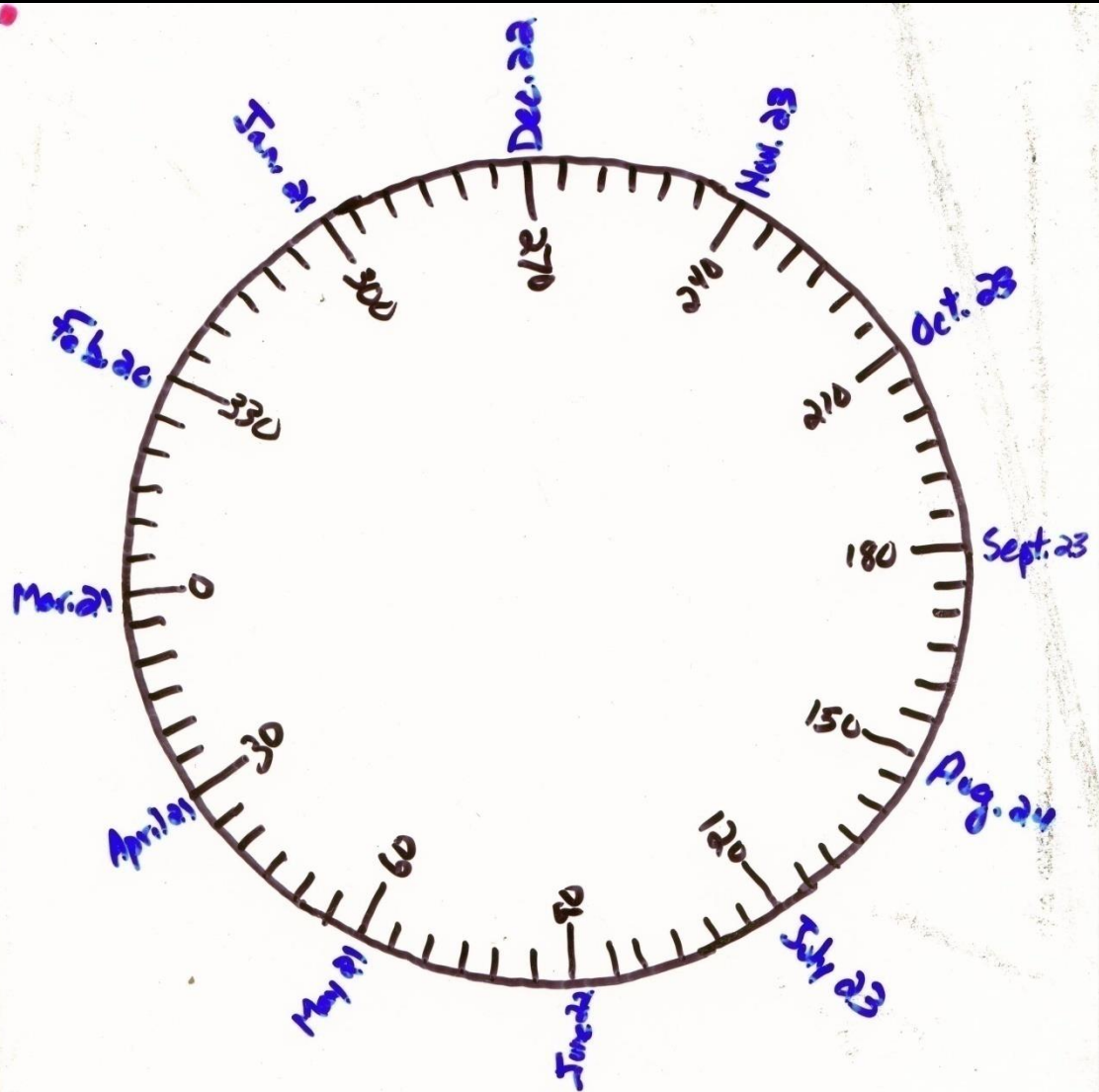


FIGURE 1

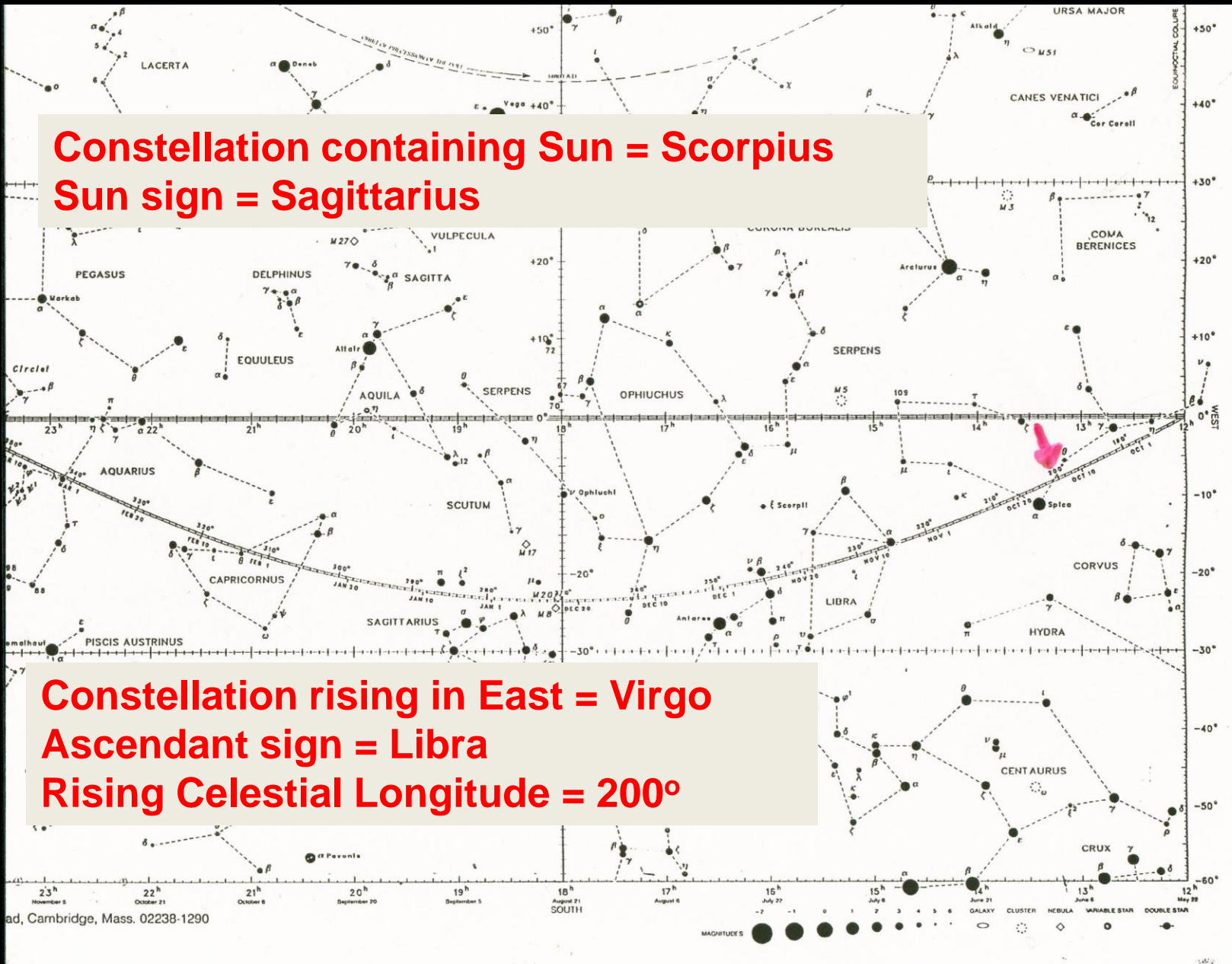
Planisphere

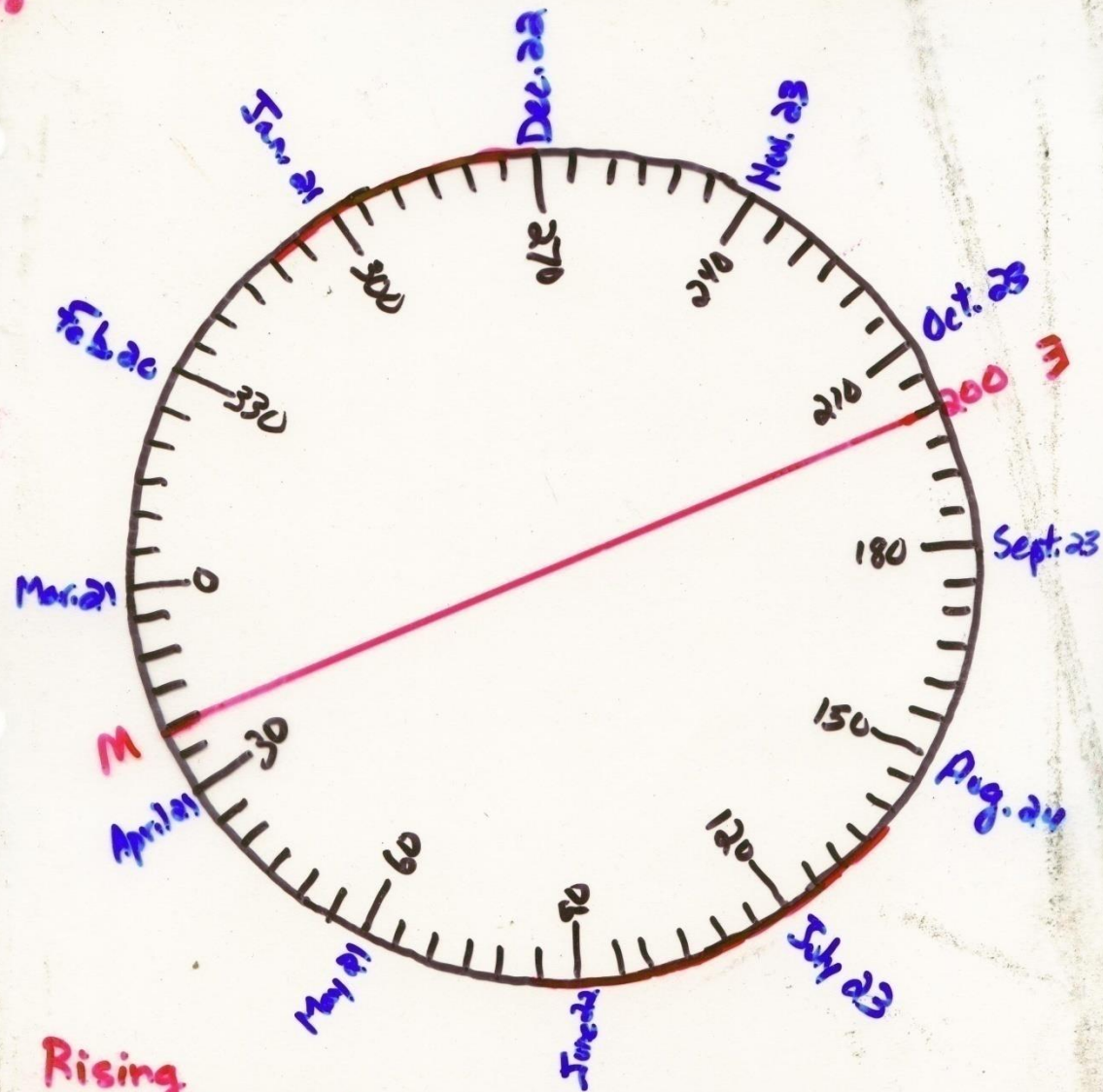
- Set for the date and time of your birth (November 30, about 5am)



Constellation containing Sun = Scorpius
Sun sign = Sagittarius

Constellation rising in East = Virgo
Ascendant sign = Libra
Rising Celestial Longitude = 200°

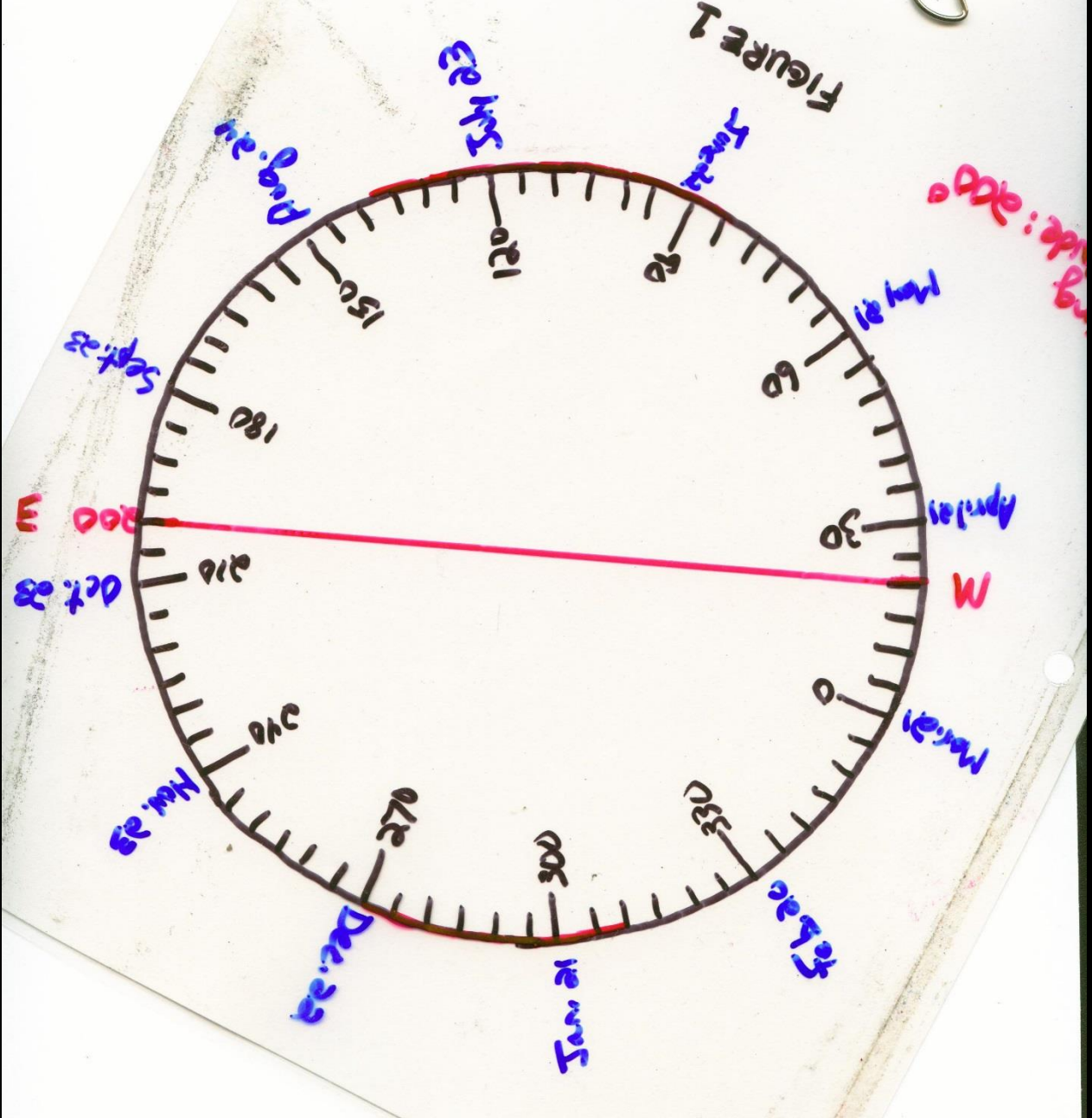




Rising
Longitude: 200°

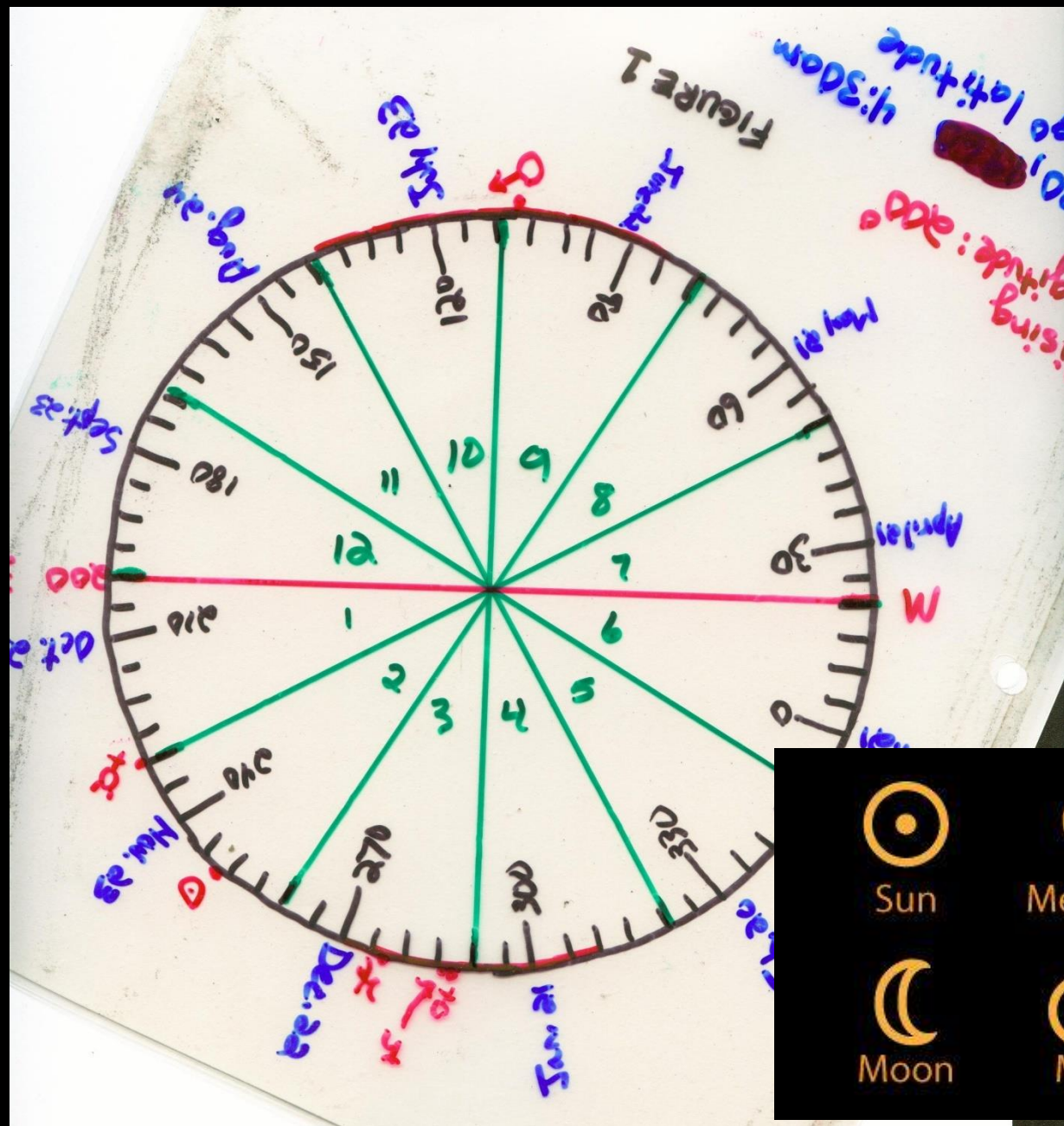
FIGURE 1

FIGURE 1



300

300



Sun



Mercury



Venus



Earth



Moon



Mars



Jupiter



Saturn

TABLE II
SUN SIGN AND ASCENDANT
MAIN CHARACTERISTICS

aries the ram

march 21
-april 20



Spontaneity, warmth, aggressiveness, enthusiasm, strength, passion, courage, a spirit of initiative and enterprise, a zest for conquest, novelty and adventure. Full of vivacity, but lacking in self-control or perseverance. Impulsive, rash, and inclined to outbursts of temperament. An original and exploratory mind. Politically an advocate of force, an extremist.

taurus the bull

april 21
-may 2



Stable, well balanced, calmly confident, strongly sensual, with a powerful appetite for life, simplicity, serenity a slow tempo. But occasional rages and violent reactions, faithfulness, steadfastness, industry, obstinacy, stubbornness, grudge bearing, patience. A practical and realistic mind, common sense. Firm, faithful and jealous in feelings. Politically, peace loving, protective toward the interests of own class.

gemini the twins

may 21
-june 21



Versatile character, flexible, light, youthful, clever, subtle, skillful, ingenious, gifted with know-how and very adaptable. But often unstable, anxious and complicated. A smart type, shrewd, cunning having special skills. venturesome, sparkling, witty, excitable, nervous. A lively quick mind. In love matters likes to flirt or play games or forms an intellectual bond. Politically, a theoretician or propagandist.

cancer the crab

june 22
-july 22



A slow-moving character, sensitive, emotional, impressionable, easily swayed, delicate, dreaming, material. Shy pensive self-effacing, retiring, childish, melancholic, attached to memories, and past and family. In love tender, family oriented, a mother hen. Politically unrealistic because over imaginative.

leo the lion

july 23
-august 23



A strong character, forceful, strong willed, conscientious, idealistic, radiant, striking, powerful, virile, commanding full of authority, having an ambition which achieves its aims, egotism, pride. A lucid clear, logical mind. In love matters, big-hearted but not free from selfishness. Politically, gets to the top posts.

virgo the virgin

august 24
-september 22



Simple nature, modest, retiring, sober, reserved, prudent, patient, with an eye to the future, precise, well-ordered regular, clean, scrupulous, also eccentric. Practical, methodical, and with administrative ability. An observant, analytic, critical intelligence. In love matters, undemonstrative, serious, inclined to celibacy or a marriage based on good sense. In politics, practical, reasonable, a supporter of order.

libra the scales

september 23
-october 22



Balanced and moderate, with a sense of proportion, harmony, appreciation for shades of meaning. In character, uncommitted, conciliatory, peaceful, indecisive. Qualities of friendliness, courtesy, sociability, mildness, kindness. A mind with a gift for comparisons, standards and harmony. Politically moderate, between the two extremes, fair, conciliatory.

scorpio the

scorpion

october 23
-november 22



An instinctive nature, violent, passionate, undisciplined, rebellious, imperious, hard, aggressive, sometimes full of hatred, but also anguished, obsessive, morbid. An instinctive mind, a "nose" for the good, curiosity. In love, obsessed by sex, suffering outbursts of passion. Politically favors violence, an extremist, aggressive, fiercely militant, combative.

sagittarius the

archer

november 23
-december 21



Thoughtful nature, reasonable, tendency to good works, conciliatory, trustful, loyal, generous, persuasive, perceptive, intelligent, more philosophical than practical. In love a calm, honest and straight forward sentiment; if thwarted free and far-ranging affections. Politics, on the side of undergod, can be tolerant and conciliatory, or rebellious and in conflict.

capricorn the

goat

december 22
-january 20



Uncommunicative nature, enclosed, reserved, sober, disciplined. Calm, reflective, patient, cold, detached, ambitious, with distant objectives. A rational mind, objective and rigorous. A geometric, abstract spirit. In love, calm and detached but faithful; a celibate. In politics, ambitious.

aquarius the

water-bearer

january 21
-february 19



A light and airy nature, vibrant, ethereal, sensitive, emotional, and idealistic. Lacking in spirit, but self-sacrificing and able to devote himself to a higher cause. A free-ranging, up-to-the-minute mind, interested in progress, reform and new ideas. In love, independent, whimsical, friendly. In politics often a progressive and in favor of reforms.

pisces the fishes

february 20
-march 20



A nature which seethes and bubbles with concealed passions; fluid and unstable impressions, undefinable sensations and emotions. Inclined to fantasy, evasiveness, hypersensibility, impressionability, indecisiveness, uncertainty; compassion, devotion, self-sacrifice. A poetic mind, intuitive, sensory and penetrating. In love matters, sensual or mystical, self-sacrificing and dedicated. In politics, produces a visionaries, leaders of popular movements, or adventurers.

TABLE III

AREAS OF LIFE REPRESENTED BY THE TWELVE HOUSES

SIGN AND DATES

SELECTED CHARACTERISTICS

FIRST HOUSE

The personality, dispositions, health, temperament, physical build and appearance. This house in essence represents the subject as he or she appears to the outsider. It has a bearing on manners, and forms of outward behaviors. A planet in the First House is a very powerful influence.

SECOND HOUSE

Possessions of all kinds, and the subject's attitude towards them; worldly resources which support the physical body. The Second House is also concerned with the feelings, especially in relationship to a planet appearing in the house.

THIRD HOUSE

Family ties, brothers, sisters, cousins, etc. School life, education; communications; letters, books, speech. The mind is also associated with this House, as is the relationship of the subject to his environment and his self-expression in daily life.

FOURTH HOUSE

The beginning and end of life; the home, as a base. This House, together with the Tenth, has a certain bearing on parents - their attitude and ability to fulfill their commitments - since personal status and home life depend to some extent on them.

FIFTH HOUSE

Creativity, children; pleasures, enterprises and new undertakings. Speculation, games of hazard, sport. Love affairs, and the objects of instinctive affection (pets, playmates, sweethearts), looseness of behavior and self-indulgence can easily occur.

SIXTH HOUSE

This House rules work; also subordinates, providing (in the past) a strong pointer to peoples' attitudes toward servants, nowadays the plumber, electrician. Shop assistant and cleaning woman are also likely substitutes. This is also the House of health although physical well-being cannot be entirely assessed from it.

SEVENTH HOUSE

As the First House relates to the personality, so the Seventh indicates those in close relationships of an emotional and business nature.

EIGHTH HOUSE

The Second House rules possessions; this House represents money from legacies, shared feelings, life-force elements of sex, birth and death, and attitudes towards death and the after-life. In addition, big business; the stock exchange, insurance companies. The Eighth is also the House of crime.

NINTH HOUSE

The educational and intellectual elements of the Third House are extended in the Ninth to further education, study in depth of profound subjects, like astronomy and mental exploration; also long-distance travel; foreigners; languages. This House also has a bearing on moral ideals, conscience and dreams.



MARS

POSITIVE MARTIAN TRAITS

Decisive, freedom-loving, a pioneer, direct in his approach, a strong leader especially in a crisis; a defender of the weak. Strongly sexed. A positive and lively response to all situations.

NEGATIVE MARTIAN TRAITS

Aggressive, irate, brutal, foolhardy, lacking forethought; selfish, quarrelsome, over-hasty, indifferent to detail, rude, boisterous.



JUPITER

POSITIVE JOVIAN TRAITS

Optimistic, generous, loyal; jovial; a kind nature; a sense of justice and compassion. Breadth of vision, well directed mental powers, flair for languages; good at sport.

NEGATIVE JOVIAN TRAITS

Blindly optimistic; an extremist; wasteful, self-indulgent, a gambler, extravagant, lawless, conceited; unbalanced in beliefs.



SATURN

POSITIVE SATURNIAN TRAITS

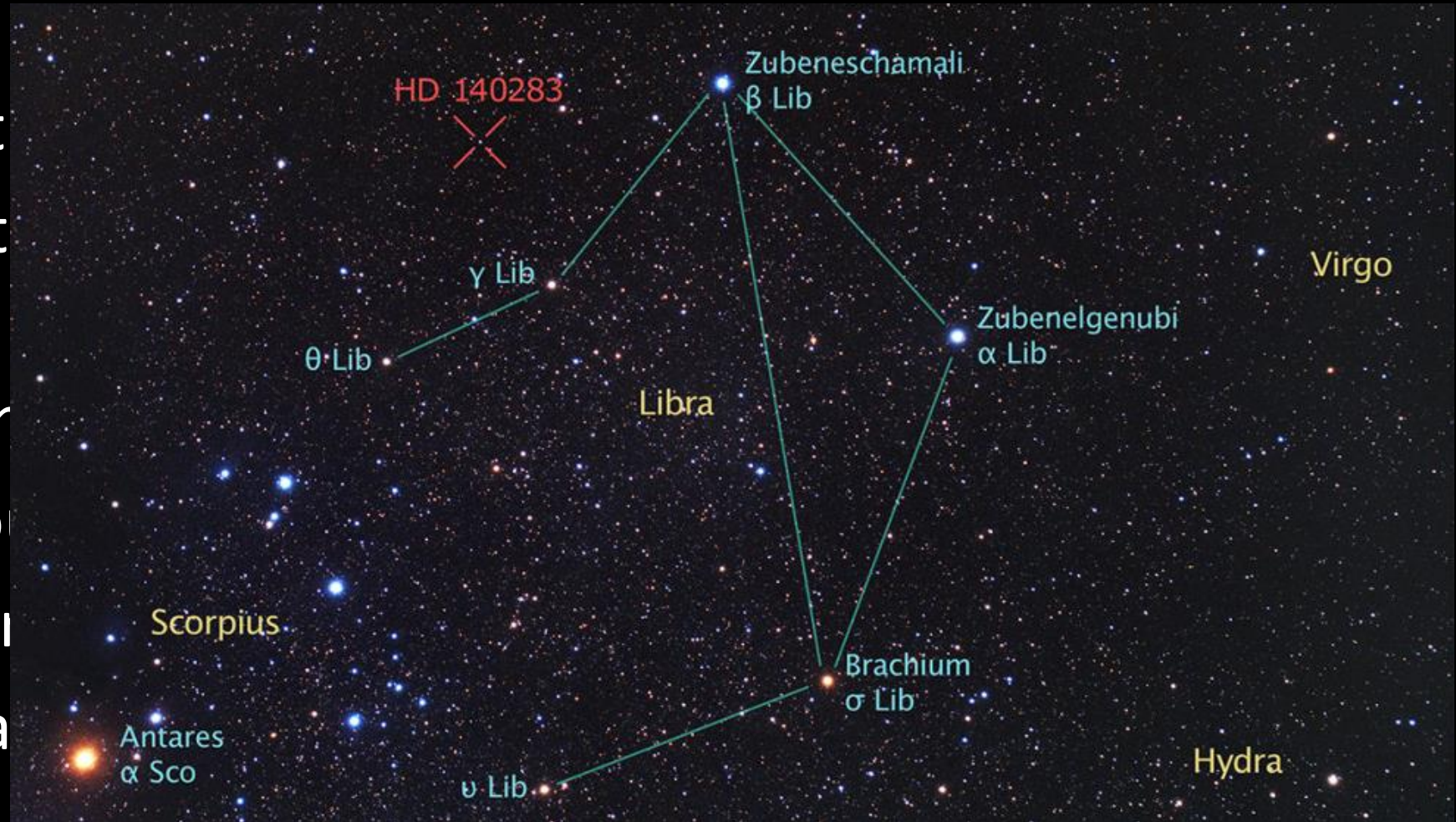
Practical, cautious, constructive, responsible, patient, ambitious thrifty; solid, reliable, trustworthy, with good endurance and self-discipline.

NEGATIVE SATURNIAN TRAITS

Mean, selfish; despondent, narrow-minded severe, aloof; dogmatic heartless, cruel; suffers depressions, hardship, a life of sorrow or ill-health.

Astrology “issues”

- People born at t
- Based on an out artificial.
- What of the Oph
- Precession! Yo
- Moon passes th
- Do Libras have a



Astrology “issues”

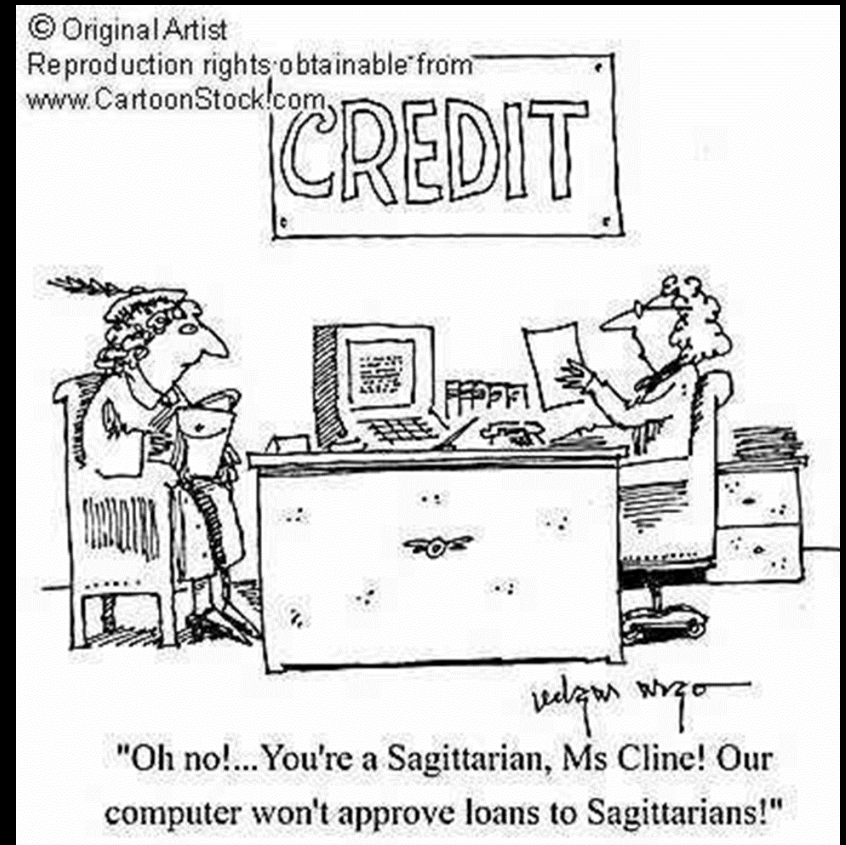
- What of horoscopes before 1781? They’re missing influence of Uranus & Neptune!
- What is the source of the “astrological force?” Is it distance dependant? If so, why does Neptune have same influence as our Moon?
- If not, what of Ceres? Sedna? Eris? Varuna? Andromeda Galaxy? Extra-solar planets?
- Why didn’t astrologers predict these objects?

Astrology “issues”

- President’s birthdays evenly spaced around calendar. Oops.
- Why are horoscopes usually positive?
- Why don’t two astrologers given same info yield the same horoscope?
- Shouldn’t identical twins lead the same lives?
- Why can’t astrologers predict major events? Misses are forgotten . . .
- Moment of conception vs. moment of birth?
- Astrologers aren’t rich (except the Reagan’s!)

Astrology "issues"

- "Predictions?" Or common sense recommendations?
- Cause/Effect?
- Bigotry? "Would YOU date a Virgo?"



So . . .why does astrology survive?

- Big money!
- Satisfies need for certainty (people like “good news!”)
- Deceptive use of astronomical terms
- Connection to the cosmos!



Enlightenment?

- Greek translated into Latin
- Insertion of both Islamic & Byzantine knowledge
- “Spirit” of enlightenment (learning for the sake of knowledge)
- Movable type



