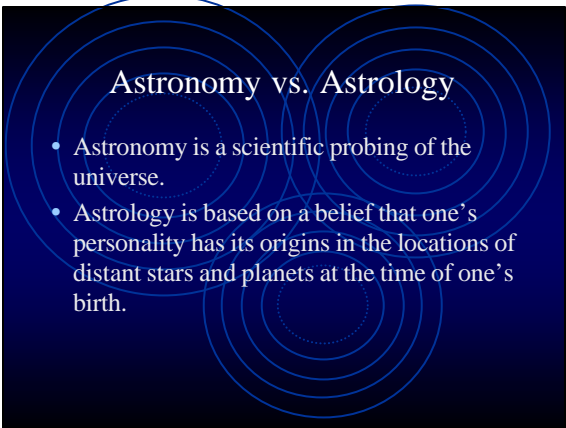


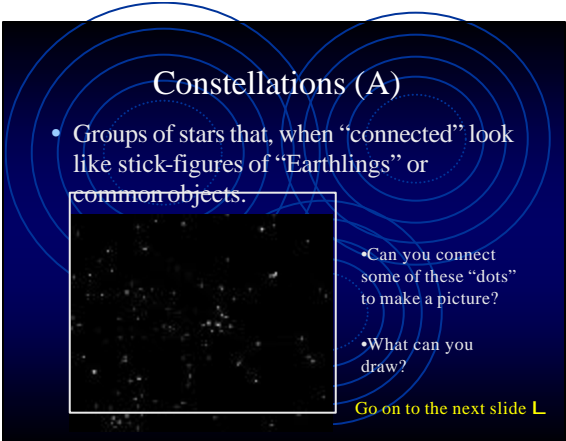
Earth's Place in the Universe

Paula Messina




Astronomy vs. Astrology

- Astronomy is a scientific probing of the universe.
- Astrology is based on a belief that one's personality has its origins in the locations of distant stars and planets at the time of one's birth.



Constellations (A)

- Groups of stars that, when "connected" look like stick-figures of "Earthlings" or common objects.

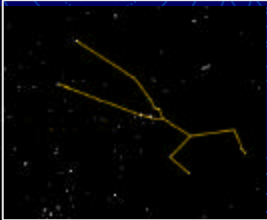


- Can you connect some of these "dots" to make a picture?
- What can you draw?

Go on to the next slide **L**

Constellations (B)

- Did you connect the stars in the configuration below?
- What type of critter does this look like to *you*?



Go on to the next slide L

Constellations (C)

- Does *this*.....look like a *bull* to you?



Taurus
The Bull

...or is this a bunch of *bull*?

Hey Babe, what's your sign?

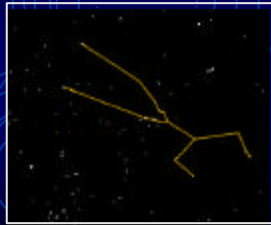
- Each full moon during the year is visible in front of a different constellation



The full moon in May is found near the constellation Taurus...so...babies that are born in May have qualities of a bull (stubbornness, strength, etc.)...
right?

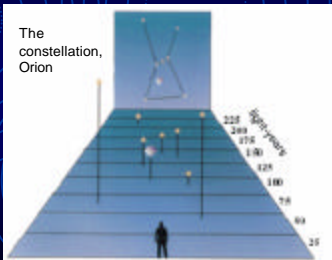
Constellations are Human Constructs

- If constellations were first being recognized today, would we see this pattern, instead, as the roof of a house, with a large TV antenna, or wireless modem, on top?



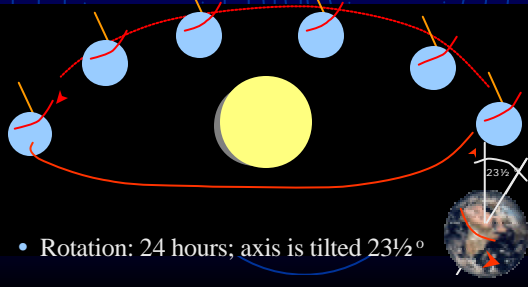
Constellations are Human Constructs

- Constellations are three-dimensional groups of stars in the vastness of space.
- As stars move, the patterns change.
- If we traveled to different parts of the universe, the patterns made by the same group of stars would be totally different!



Motions of the Earth, Reviewed

- Revolution: 365 ¼ days, orbit is elliptical



- Rotation: 24 hours; axis is tilted 23½°

Earth's Orbit Brings Us To Different Sections of Space

- At times, Earth approaches areas rich in "space junk," like the remnant-tails of comets.
- We can experience "meteor showers" in instances like this.

Yet Another Motion: Precession of the Axis

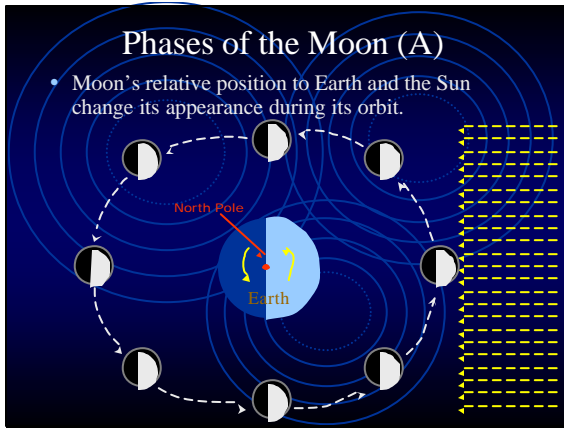
- Earth's axis is currently "pointing" toward the star, Polaris
- 13,000 years ago, the North Pole pointed toward the star, Vega
- Precession is a 26,000 year cycle
- Precession of Earth's axis has an affect on Earth's climate

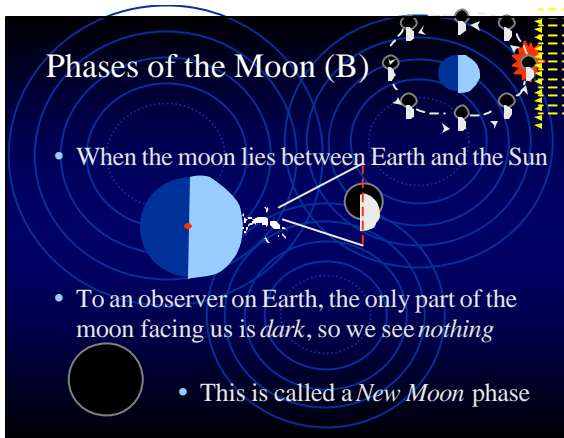
Think of Earth as a wobbly, spinning top

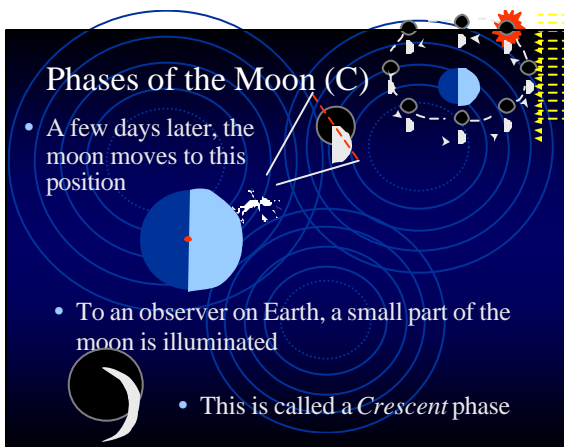
The Earth-Moon System

Clementine's view of the Earth-moon system

- The moon is Earth's only natural satellite
- It revolves around Earth in approximately one month
- Only one side of the moon is lit by the Sun at any given time
- Only one side of the moon is visible from Earth







Phases of the Moon (D)

- About a week after the New Moon, the moon travels to this position
- To an observer on Earth, half of the moon's face is illuminated
- This is called the *First Quarter* phase

Phases of the Moon (E)

- A few days after the First Quarter, the moon has moved to this position
- To an observer on Earth, most of the moon's face is illuminated
- This is called a *Gibbous* phase

Phases of the Moon (F)

- About two weeks after the New Moon phase, the moon has completed half its orbit
- To an observer on Earth, the entire side facing us is illuminated
- This is called a *Full Moon* phase

Phases of the Moon (G)

- A few days after the Full Moon, the moon has moved to this location.
- To an observer on Earth, most of the moon's face is illuminated
- This is called a *Gibbous* phase

Phases of the Moon (H)

- About a week after the Full Moon, the moon has completed $\frac{3}{4}$ of its orbit
- To an observer on Earth, half of the moon's face is illuminated
- This is called a *Quarter* phase

Phases of the Moon (I)

- A few days after the Quarter Moon, the moon moves to this position
- To an observer on Earth, only a small portion of the moon's face is illuminated
- This is called a *Crescent* phase

Phases of the Moon (J)

- About one month after the previous New Moon Phase, the moon is once again totally dark
- To an observer on Earth, none of the moon's face is illuminated
- This is called a *New Moon* phase

Phases of the Moon (K)

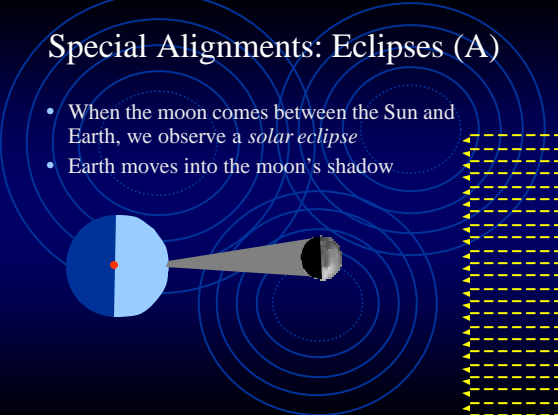
- A complete cycle of lunar phases takes 29½ days. This is called a "synodic month."
- As the illuminated portion of the moon's face increases (from New Moon to Full Moon), we say the moon is "waxing."
- As the illuminated portion of the moon's face decreases (from Full Moon to New Moon), we say the moon is "waning."

Are you a lunatic?

- Do lunar phases affect human behavior?

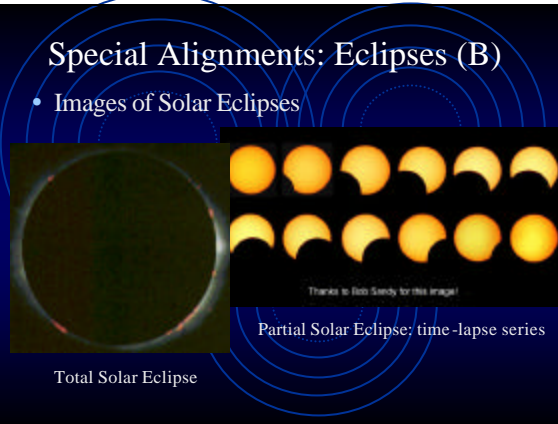
Special Alignments: Eclipses (A)

- When the moon comes between the Sun and Earth, we observe a *solar eclipse*
- Earth moves into the moon's shadow



Special Alignments: Eclipses (B)

- Images of Solar Eclipses



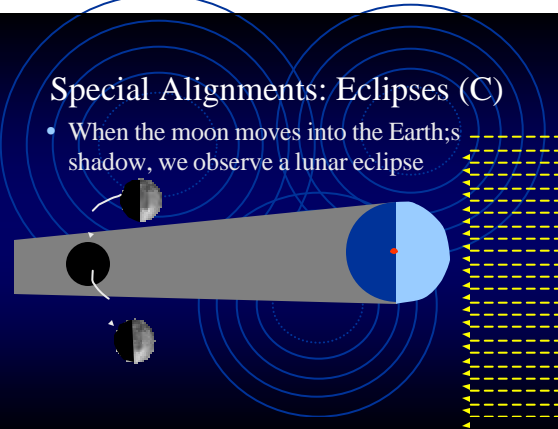
Total Solar Eclipse

Partial Solar Eclipse; time-lapse series

Thanks to Edo Sandy for this image!

Special Alignments: Eclipses (C)

- When the moon moves into the Earth's shadow, we observe a lunar eclipse



Special Alignments: Eclipses (D)

- Images of Lunar Eclipses



Lunar Eclipse: time-lapse series
