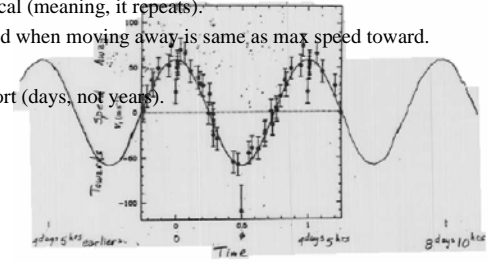


Greek Cosmology—27 Aug

- Finish 51 Peg
- What did Greek cosmologists study?
- Eratosthenes measures the Earth

51 Pegasi

- Michael Mayor & Didier Queloz discovered something important by studying the star 51 Pegasi.
- Clues uncovered by class on 8/25
 - The star 51 Pegasi is moving slowly. Max is 60m/s. Earth's speed is 30km/s.
 - Motion is cyclical (meaning, it repeats).
 - Maximum speed when moving away is same as max speed toward.
 - Speed changes
 - Its period is short (days, not years).



Orbit of 51 Peg

- How big is the orbit?
- Speed is 60m/s. Period is 4day 5hr = 101hr.
- Circumference is $60\text{m/s} \times (3600\text{s/hr}) \times 101\text{hr} = 22,000\text{km}$
- Circumference of Earth is 40,000km
- Sun is 100 times bigger.
- Planet causes 51 Peg to move $1/200^{\text{th}}$ of its radius.

What did Greek cosmologists study (200BC-200AD)

- Cosmology is the study of the universe at the largest scales
- Eratosthenes measured the size of the earth.
- Hipparchus measured the distance to the moon.

Erathosthenes ~200 BC

- A correspondent in Syene reports that at noon on the summer solstice, the sun illuminates the bottom of a well. In Alexandria (where Erathosthenes lived), a stick makes a 7° shadow.
- It takes a camel 50 days to travel from Syene to Alexandria. A camel can travel 100 stadia/day.
- “A clear picture is 90% of clear thinking.”
- Draw a picture to show the relationship between the sun, the well, the stick, and the two locations.
- What is the distance between Alexandria & Syene in km?