Class 3: Astronomy 101

Where are we in the universe?

Planet?  Galaxy?
Supercluster?  Universe?
Star-orbiting system?  Cluster Group?
Our Cosmic Address

Our Cosmic Address

Our Cosmic Address
Our Cosmic Address

Our Cosmic Address

Our Cosmic Address

Our Cosmic Address
Our Cosmic Address

How do we know?  
Who is responsible?

Early Astronomers

• 500 BC  Pythagoras - thought Earth was round from moon observations
• 350 BC  Aristotle - Earth at center of “universe”, planets/stars moved around Earth
• 250 BC  Aristarchus - measured relative distance to Sun & moon using angles; Sun very BIG; at center of “universe”
• 200 BC  Eratosthenes - measured size of the Earth using angles of sun at noon at 2 places
Ptoo bad for Ptolemy

Crazy (but not really) Copernicus

Galileo the Great
Keeping up with Kepler

Kepler Law # 1

Kepler Law # 2
Kepler Law # 3

Modern Astronomers

• Percival Lowell (1855 - 1916 A.D.)
  - observed canals on Mars

• Carl Sagan (1934 - 1996 A.D.)
  - discovered hot, dense atmosphere on Venus
  - lead many searches for extra-terrestrial life

• Eugene & Carolyn Shoemaker
  - Eugene: linked Earth and moon craters to asteroid impacts
  - Carolyn: discovered more comets (32) than any other person

What is a wave?
Main functions of optical telescopes?

Radio Telescopes

What do radio telescopes do?
Where should they go?

Telescopes and Observatories
(you should visit)