

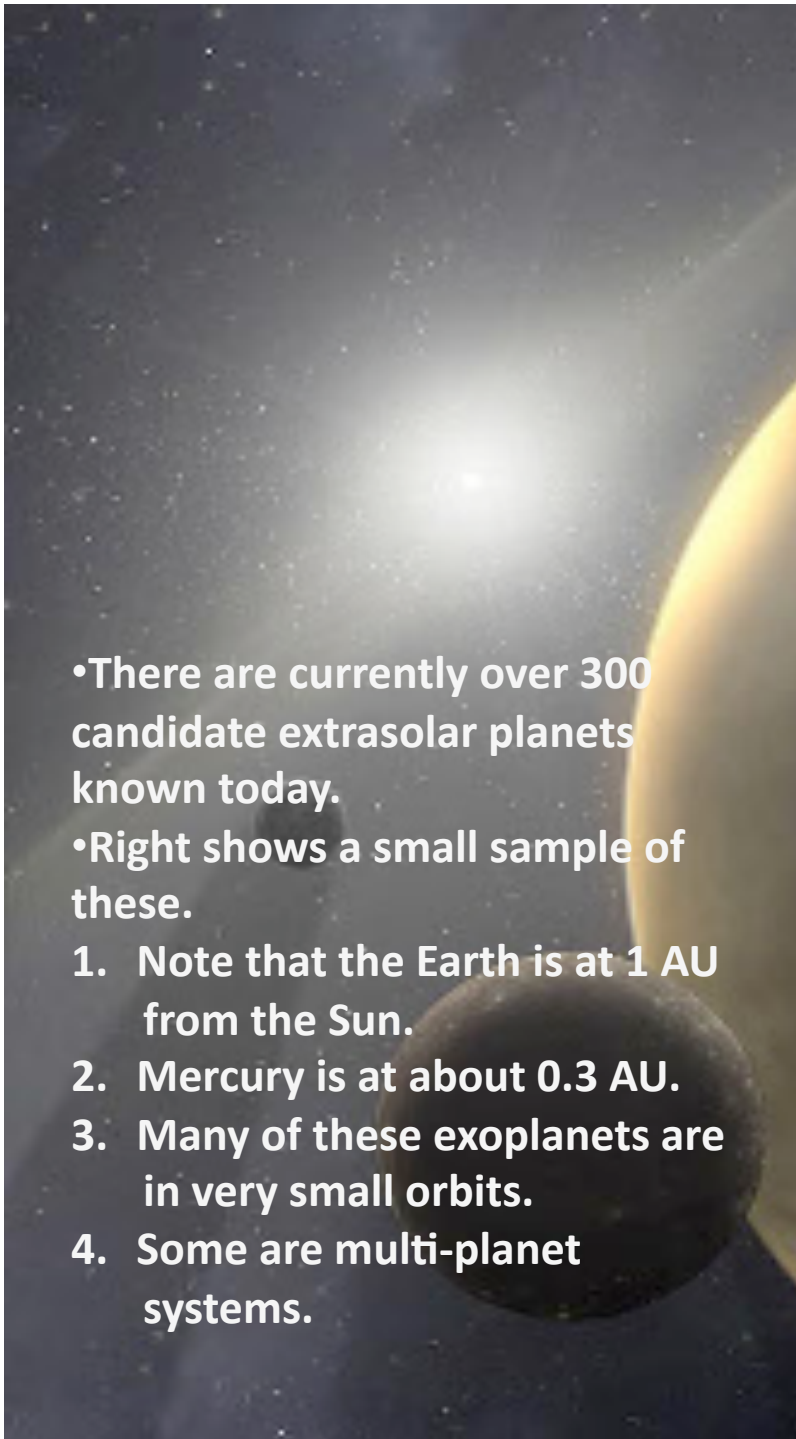


**Exoplanets – *Worlds Around  
Other Stars***

RICHARD IGNACE

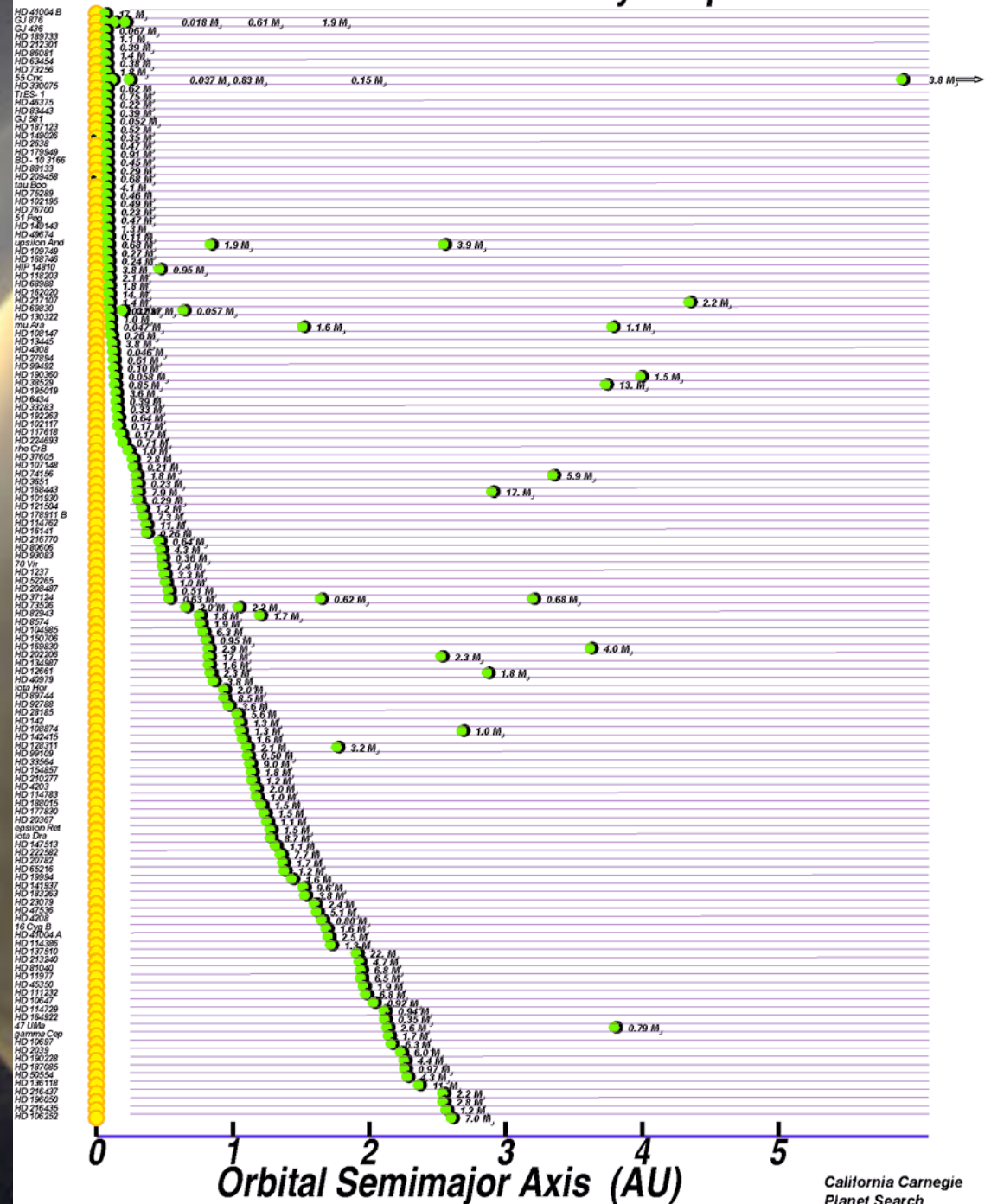
PHYSICS & ASTRONOMY

EAST TENNESSEE STATE UNIVERSITY



- There are currently over 300 candidate extrasolar planets known today.
  - Right shows a small sample of these.
1. Note that the Earth is at 1 AU from the Sun.
  2. Mercury is at about 0.3 AU.
  3. Many of these exoplanets are in very small orbits.
  4. Some are multi-planet systems.

## The 178 Known Nearby Exoplanets



# EXAMPLE OF THREE IMAGED PLANETS

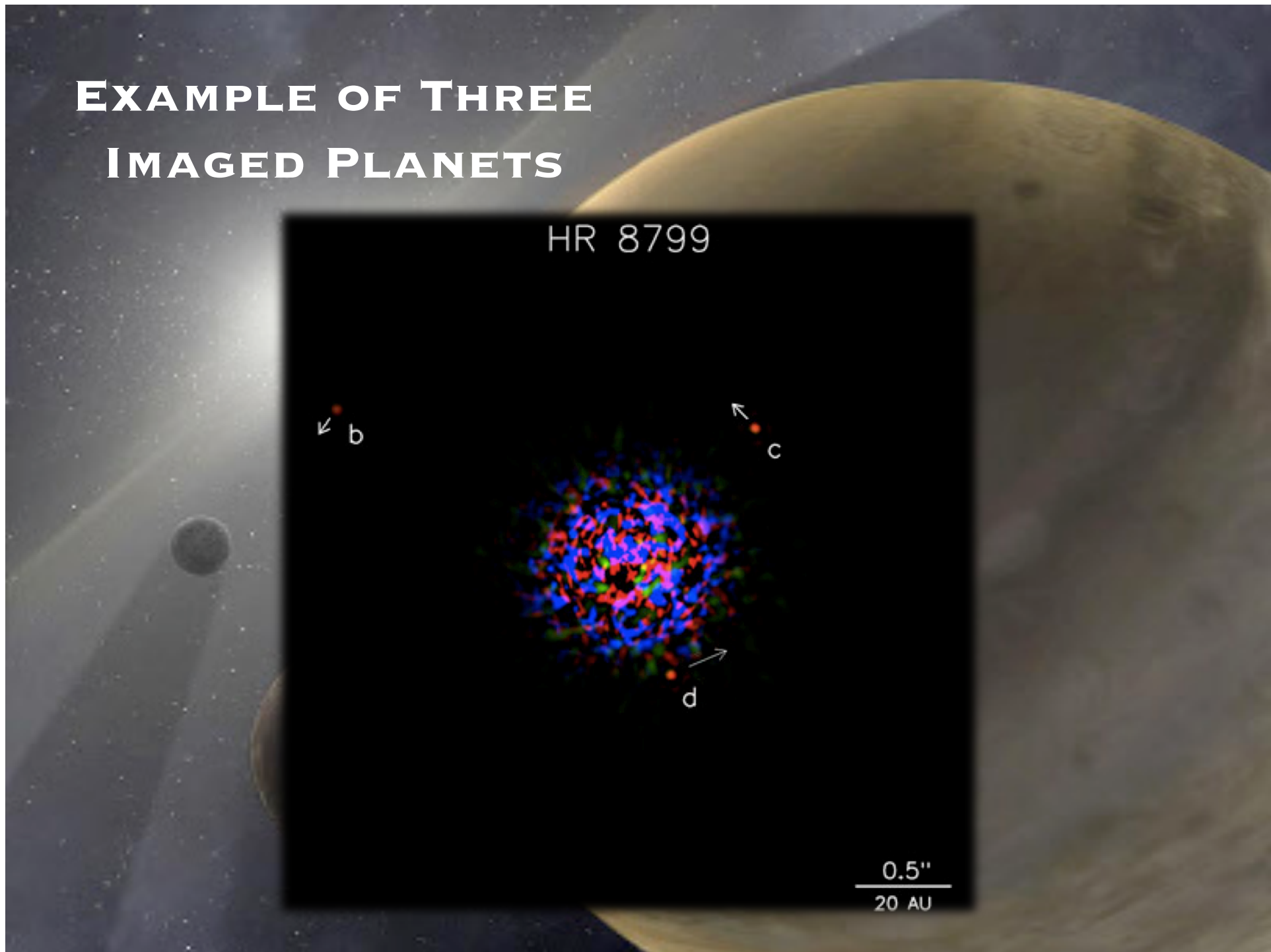
HR 8799

b

c

d

0.5"  
20 AU



# ANOTHER EXAMPLE OF AN IMAGED PLANET

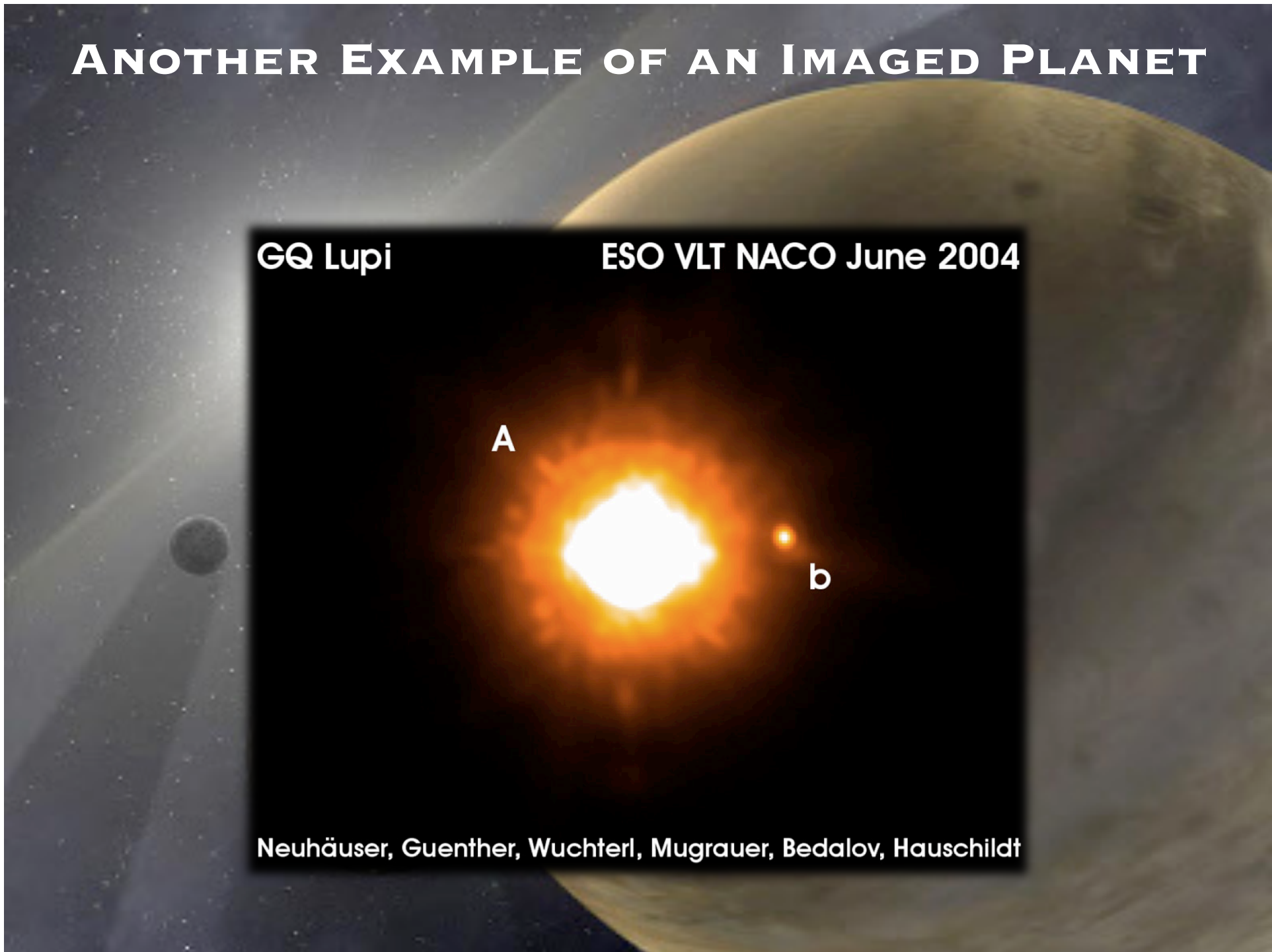
GQ Lupi

ESO VLT NACO June 2004

A

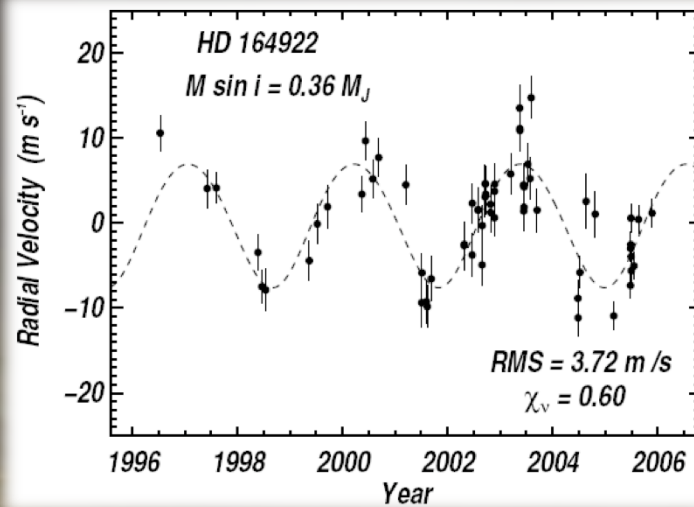
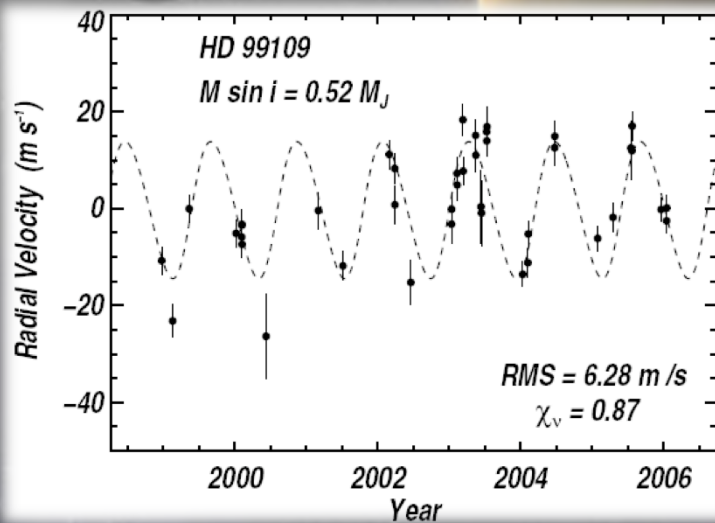
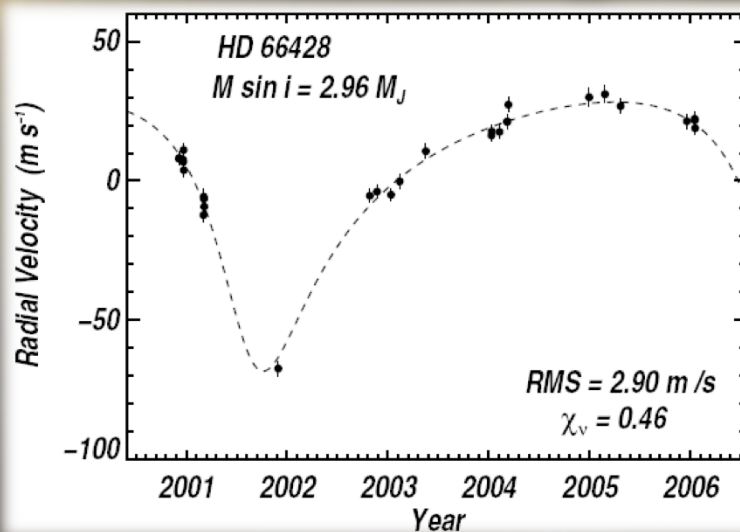
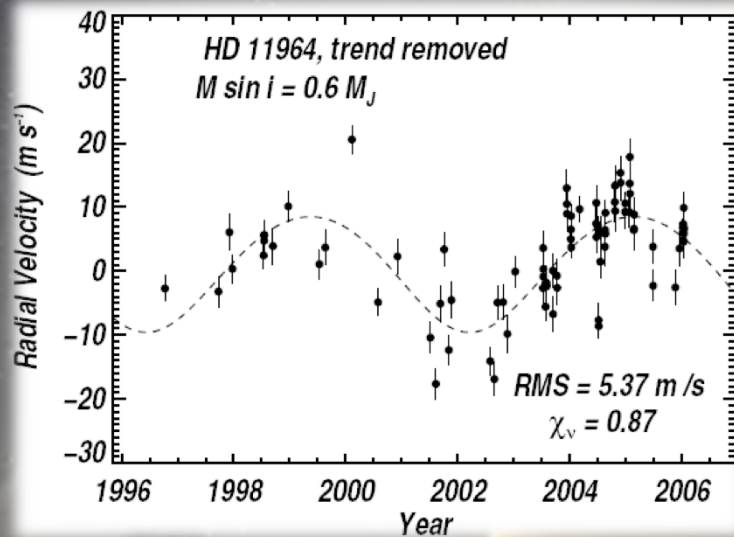
b

Neuhäuser, Guenther, Wuchterl, Mugrauer, Bedalov, Hauschildt

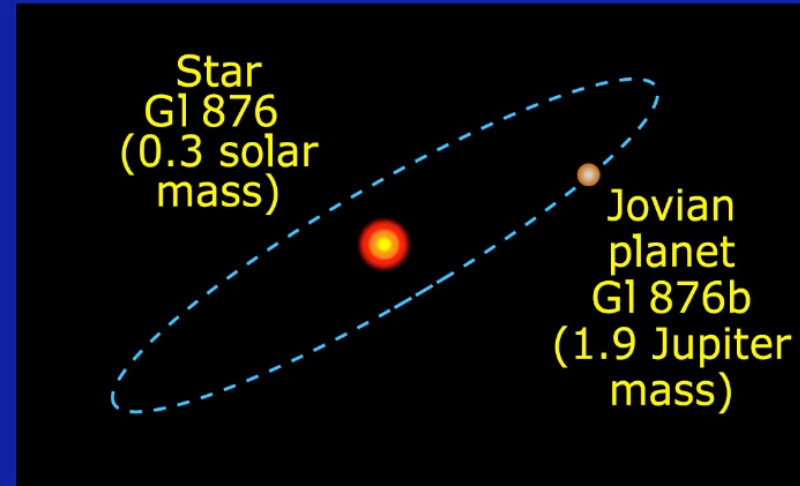




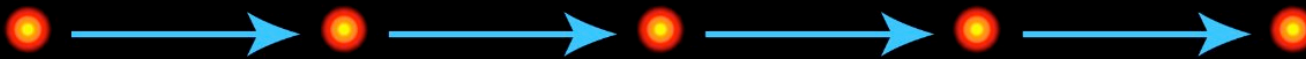
# FINDING PLANETS FROM STAR MOTION



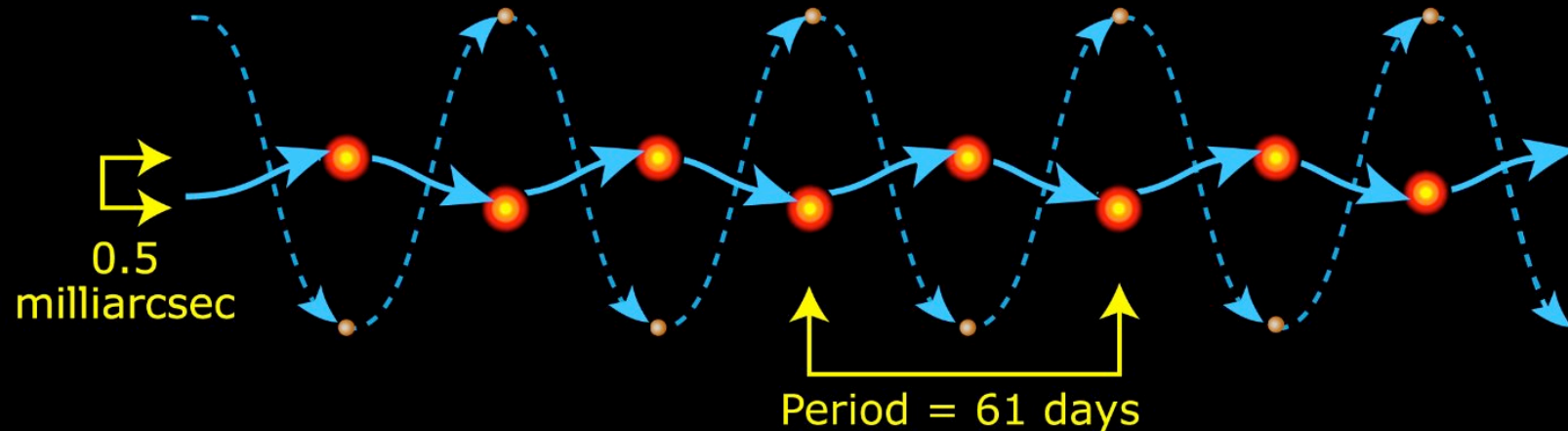
# Hubble measures minute variation in star's motion due to gravitational pull from companion planet G1 876b



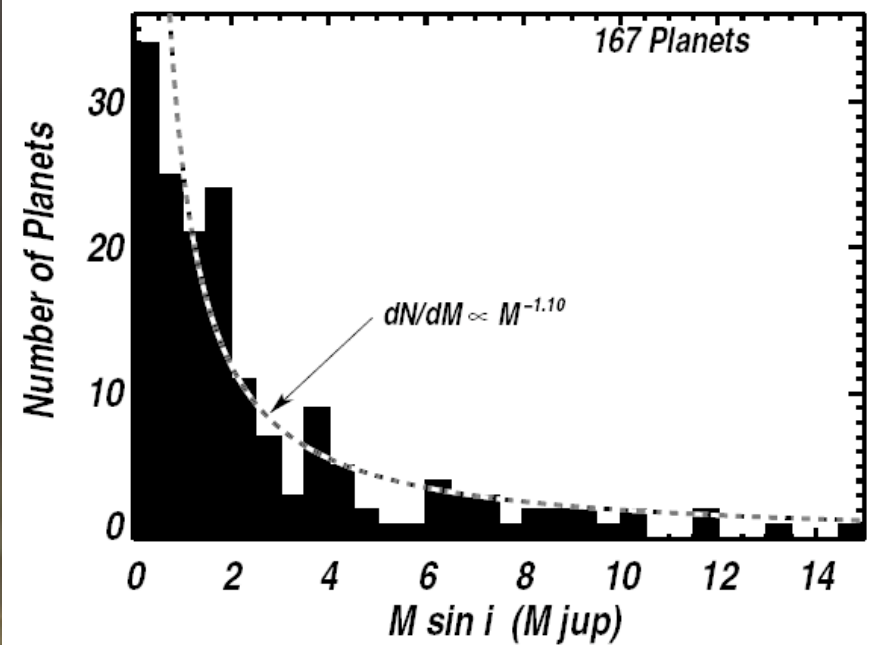
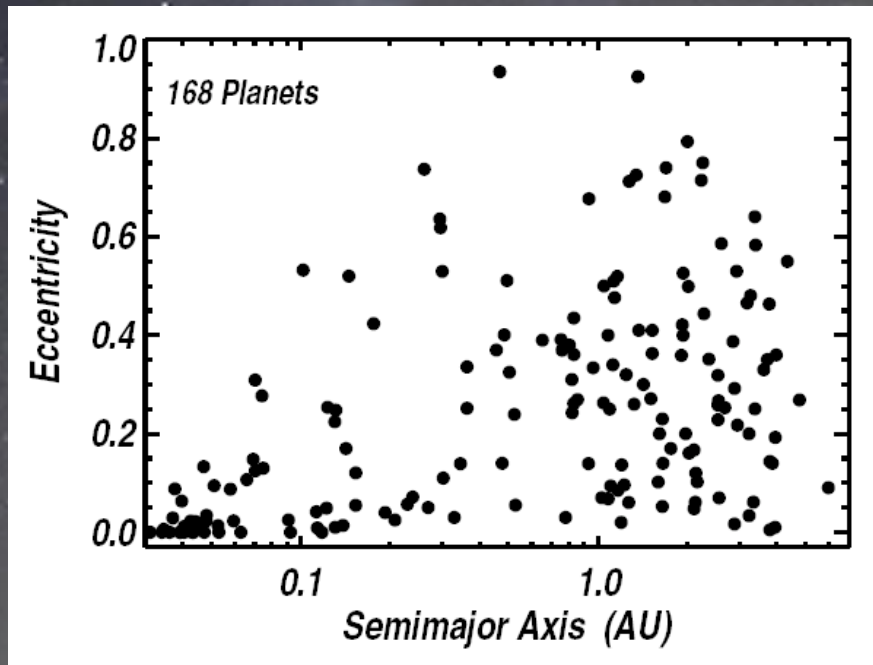
Star G1 876 without planet: Moves in straight line



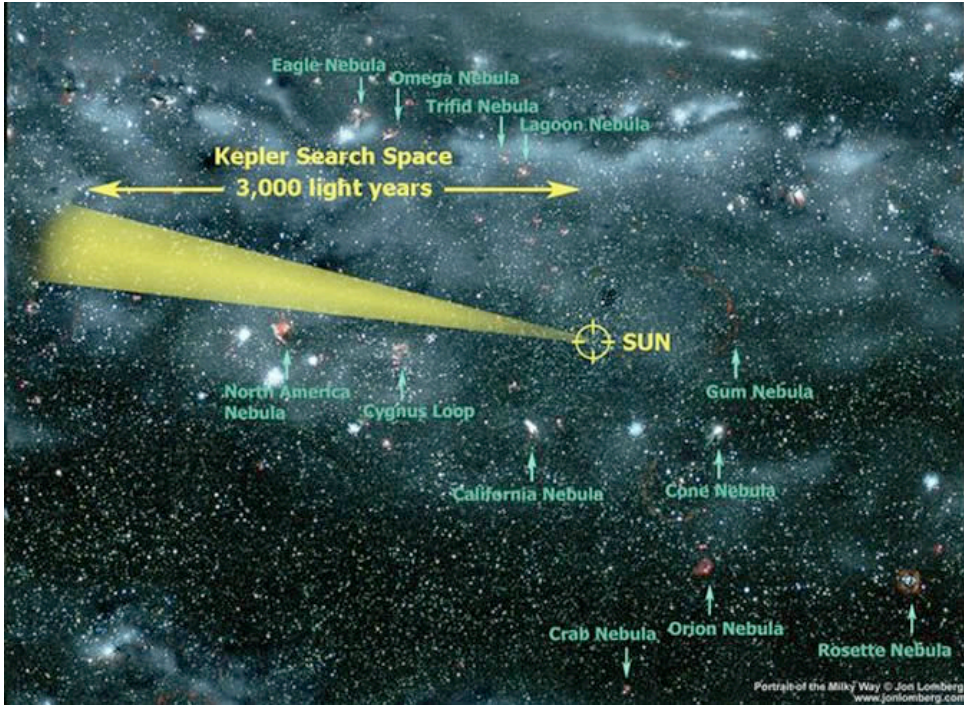
Star G1 876 (visible) with planet (invisible): "Wobble" detected



# PLANET PROPERTIES

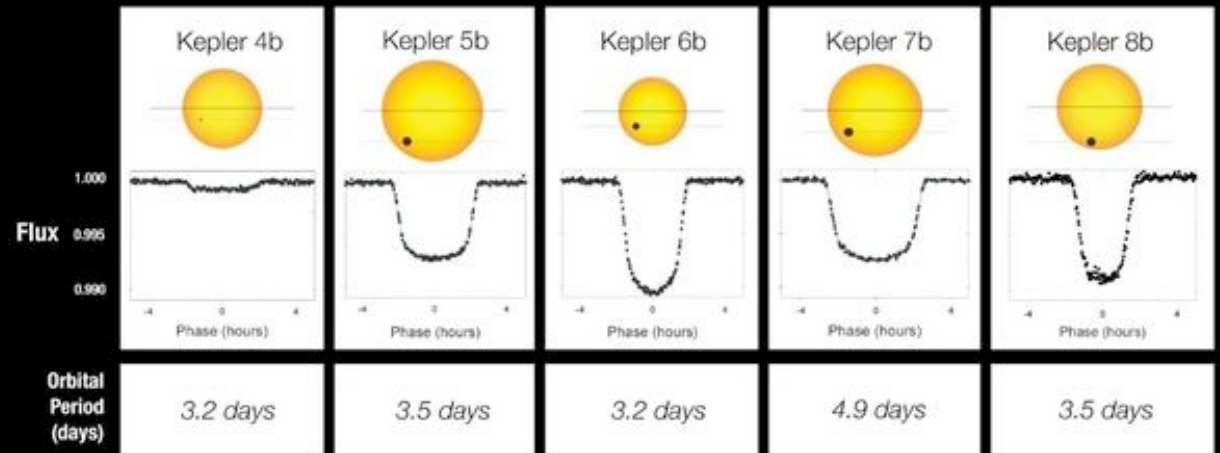






# NASA'S KEPLER MISSION: TRANSIT SEARCHES

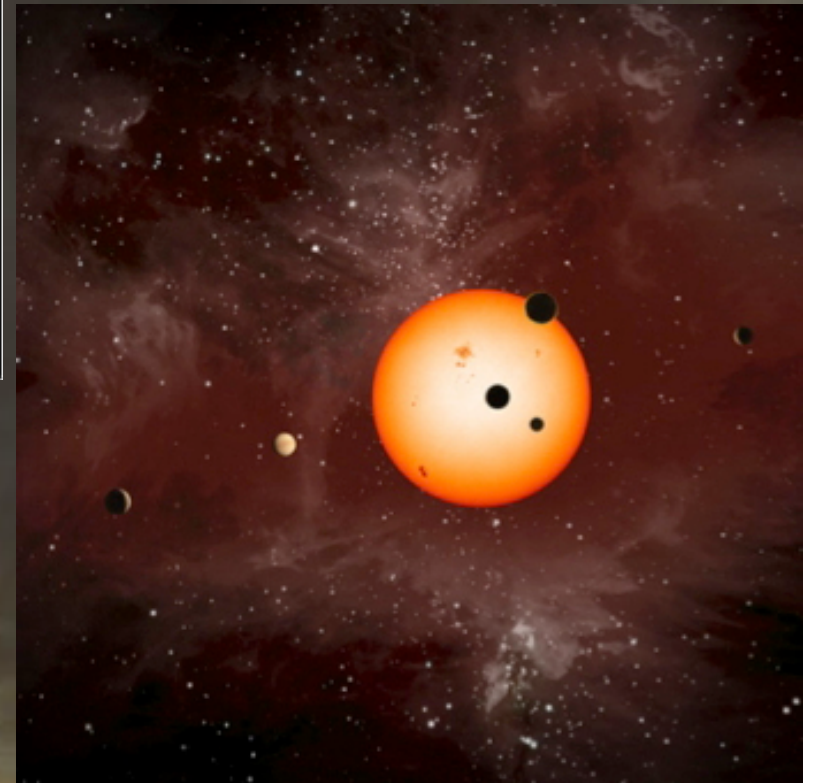
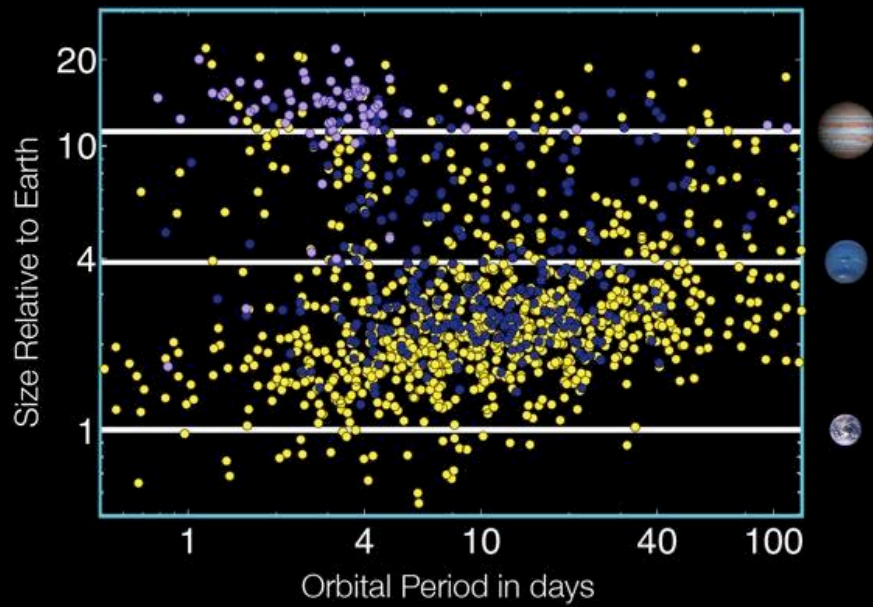
## Transit Light Curves



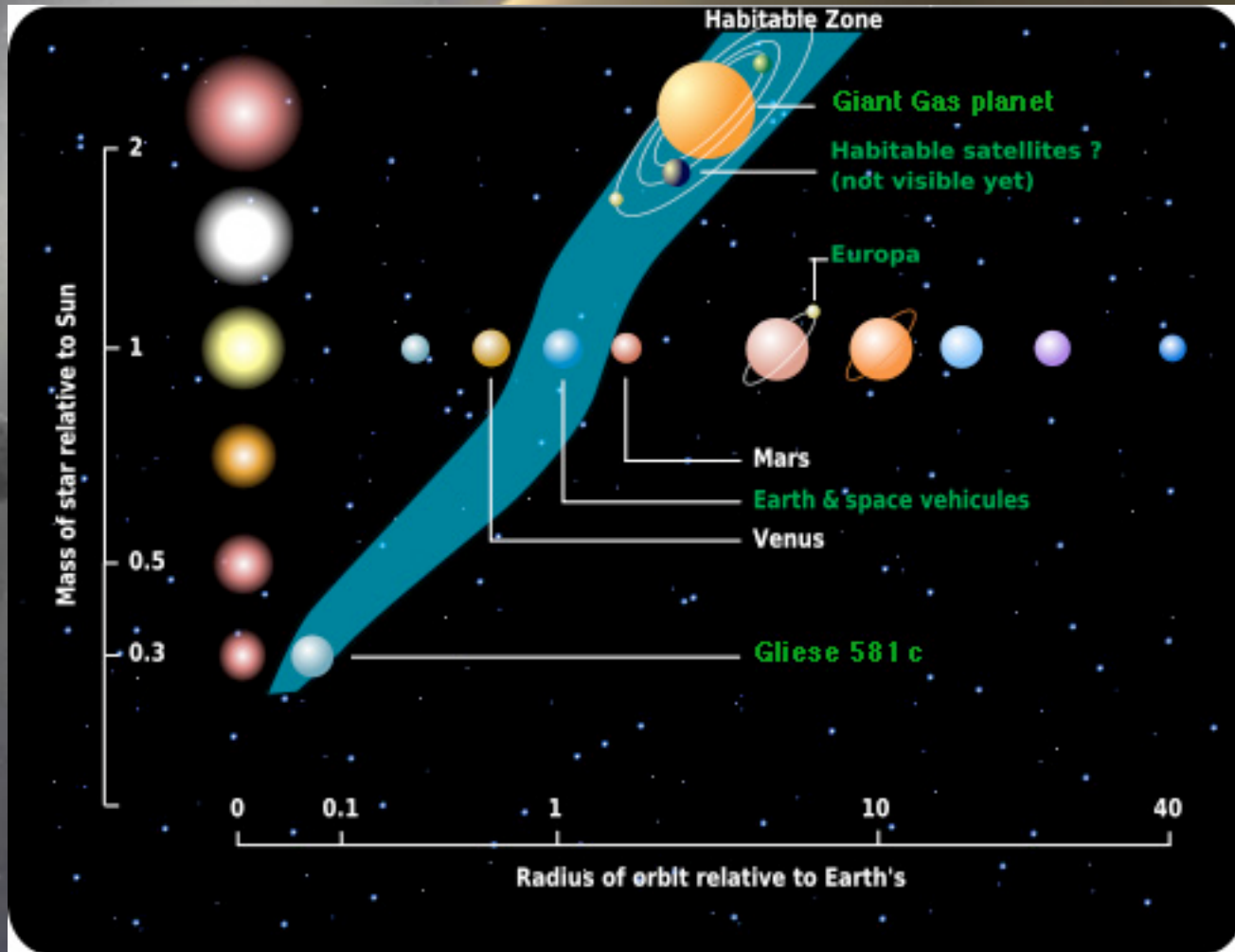


# KEPLER RESULTS

Kepler Candidates as of February 1, 2011



# The Habitable Zone



# THE END OF PLANETARY SYSTEMS

