A Search for Exomoons
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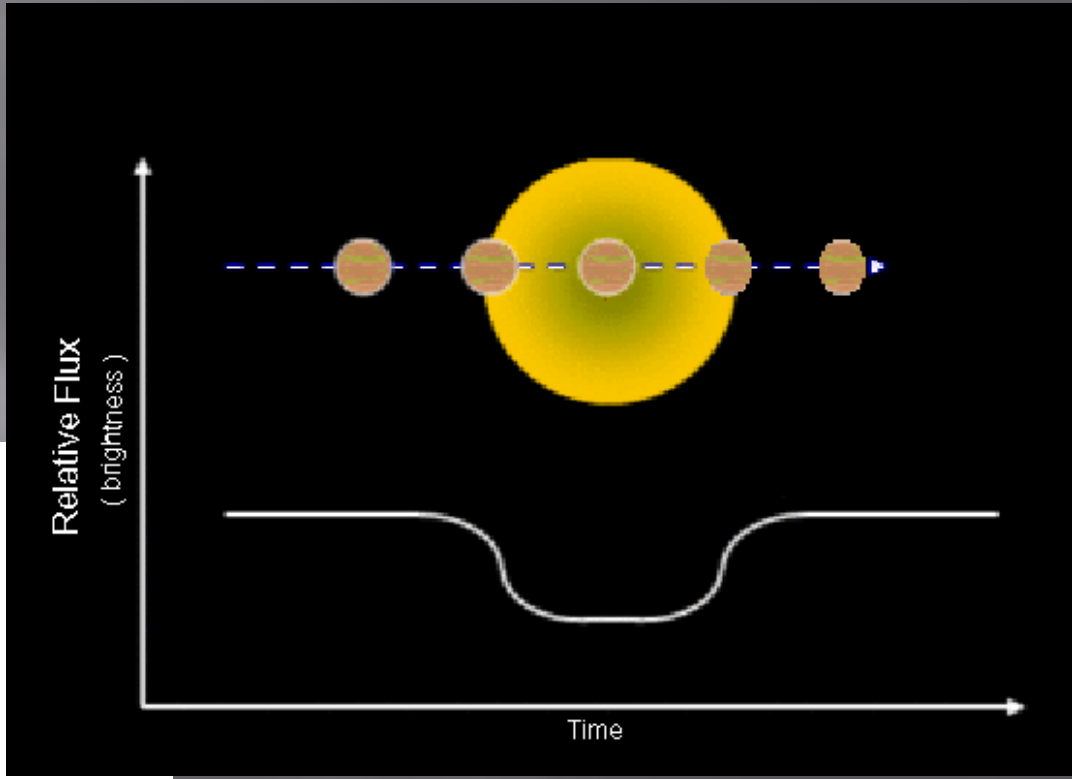
For the Carl Sagan Fellowship program

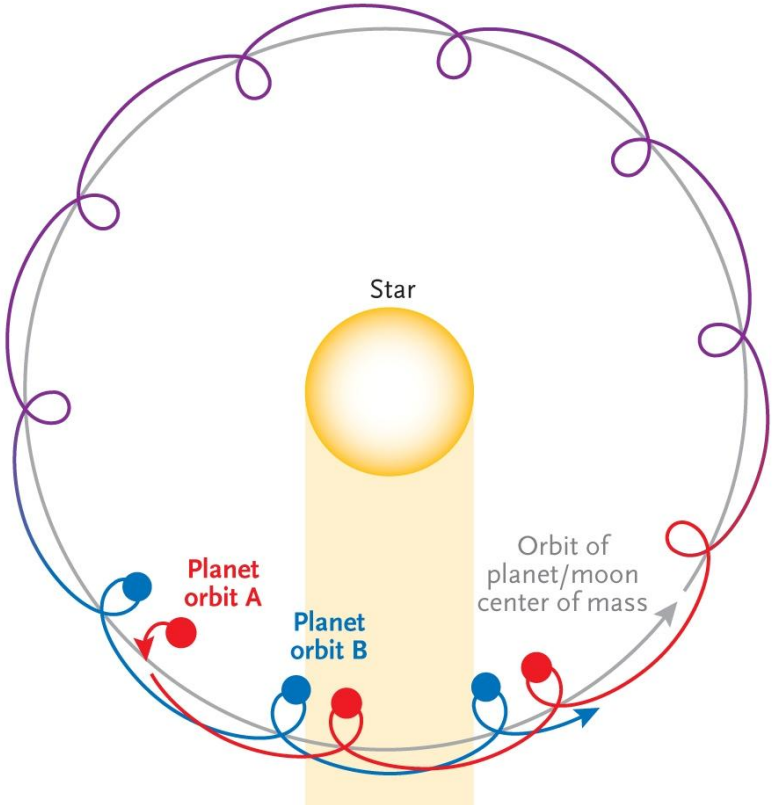
Exomoons 101

- ***WHAT?*** An “exomoon” is simply the moon of a planet which is outside of our Solar System.
- ***WHY?*** Exomoons may be common habitable environments in the Universe.
- ***HOW?*** Exomoons are tough to find, but we can spot them by looking for wobbles in a planet’s motion.
- ***WHERE?*** Planets which eclipse their host star allow us to measure their positions and velocity very accurately, so this is a good place to start!
- ***WHEN?*** If moons of the same size and mass as the Earth are common, we can detect them with *Kepler* in the near future. Otherwise we may have to wait.

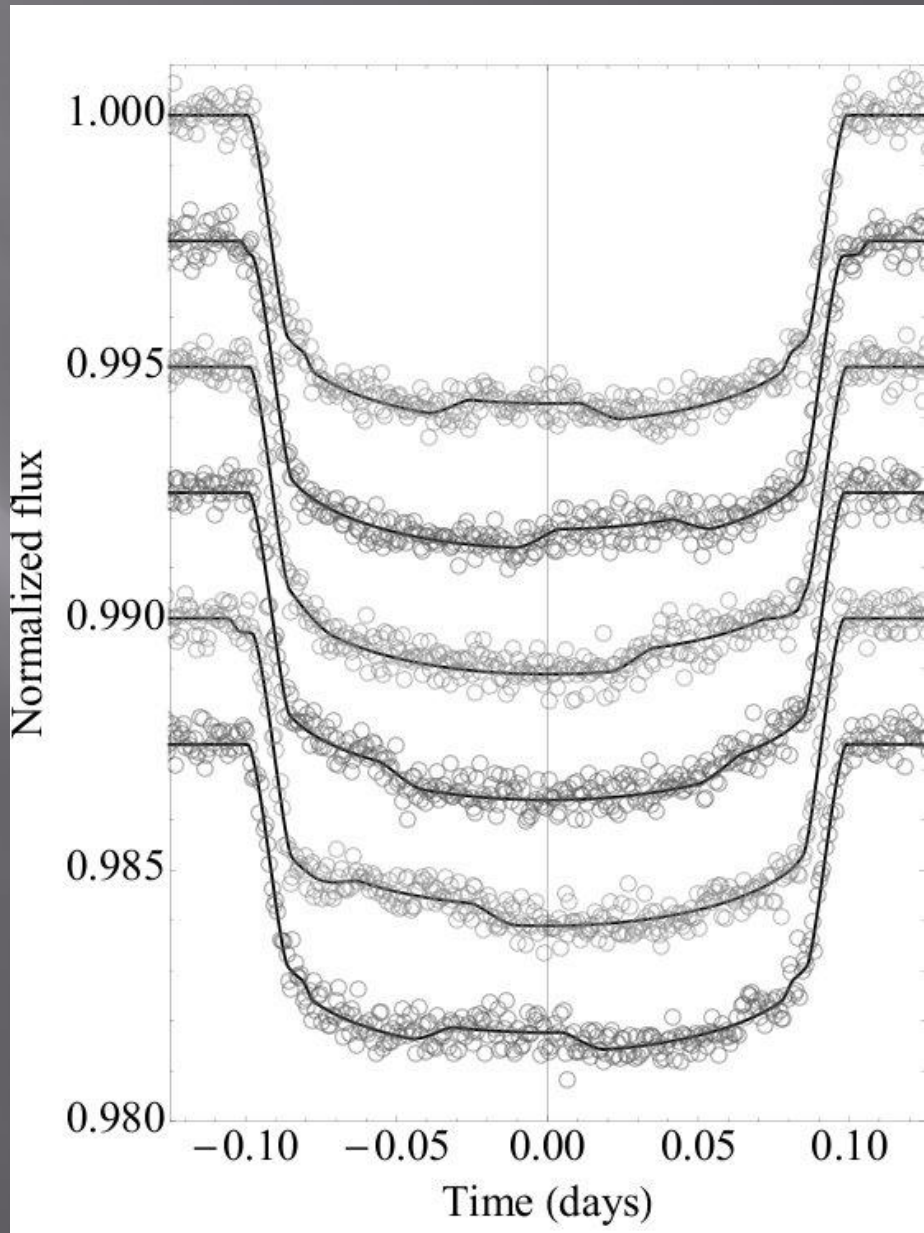
Wobbling Exoplanets

The moon gravitationally tugs on the host planet, causing its position and velocity to vary (see below)





When a planet eclipses its star, the star becomes dimmer for a short time. These eclipses allow us to measure positions and velocity (see above)

Eclipsing Moons

- Moons can be detected by looking for wobbling planets.
- **BUT** we can also look for the eclipse of the moon itself!
- When the planet **AND** moon eclipse, we get complex patterns for the dimming of the star (see right).
- Those bumps in the middle of the eclipse events are due to **the moon eclipsing the planet**!