

Life

12/7/2009

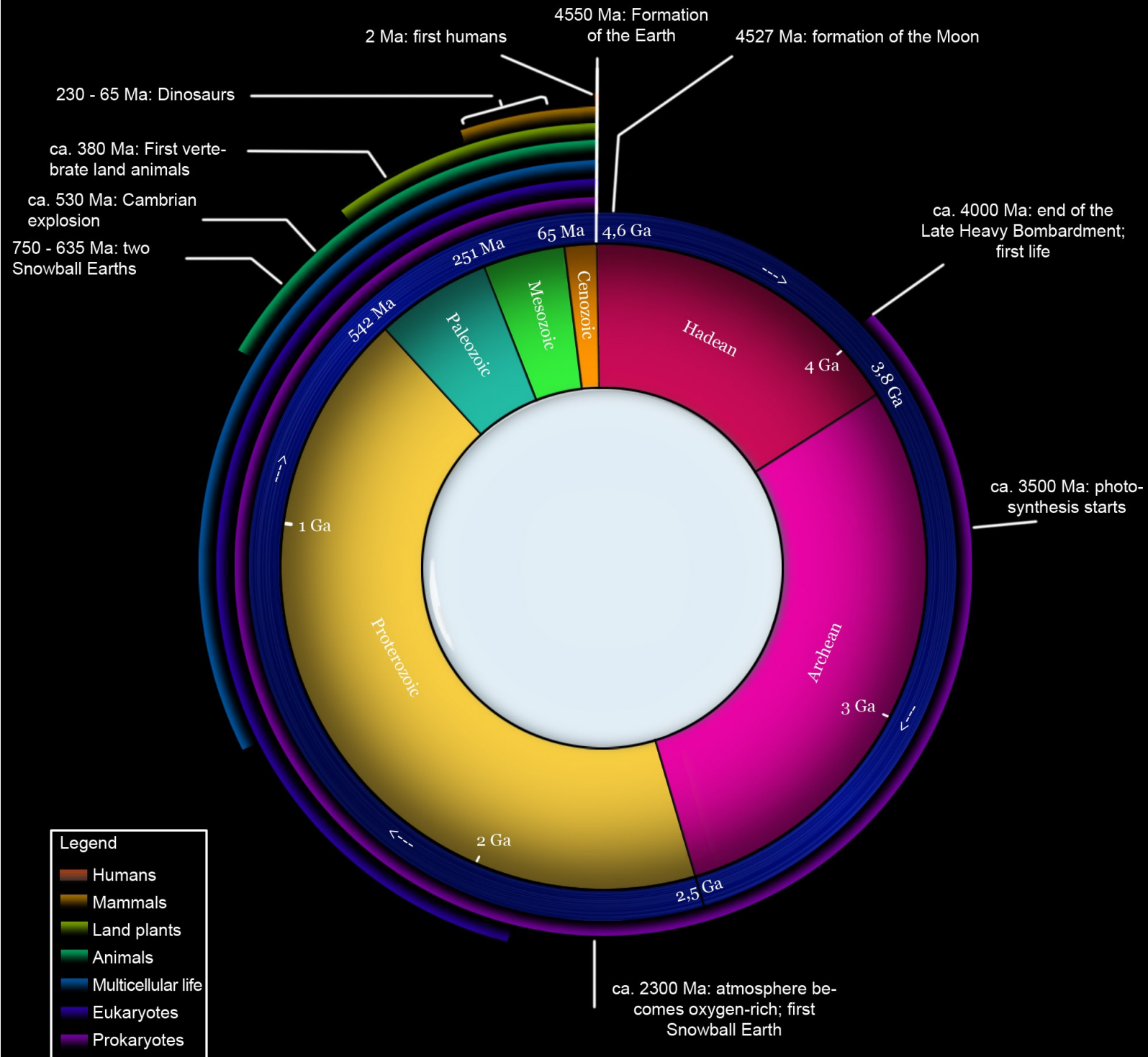
Opening Discussion

- <http://www.youtube.com/watch?v=ueUOTImKp0k&>
- <http://www.universetoday.com/2009/12/03/cool-liter>
- What did we talk about last class?
- Validity of no greenhouse formula.
- Minute essays
 - Earth-sized vs. Earth-like

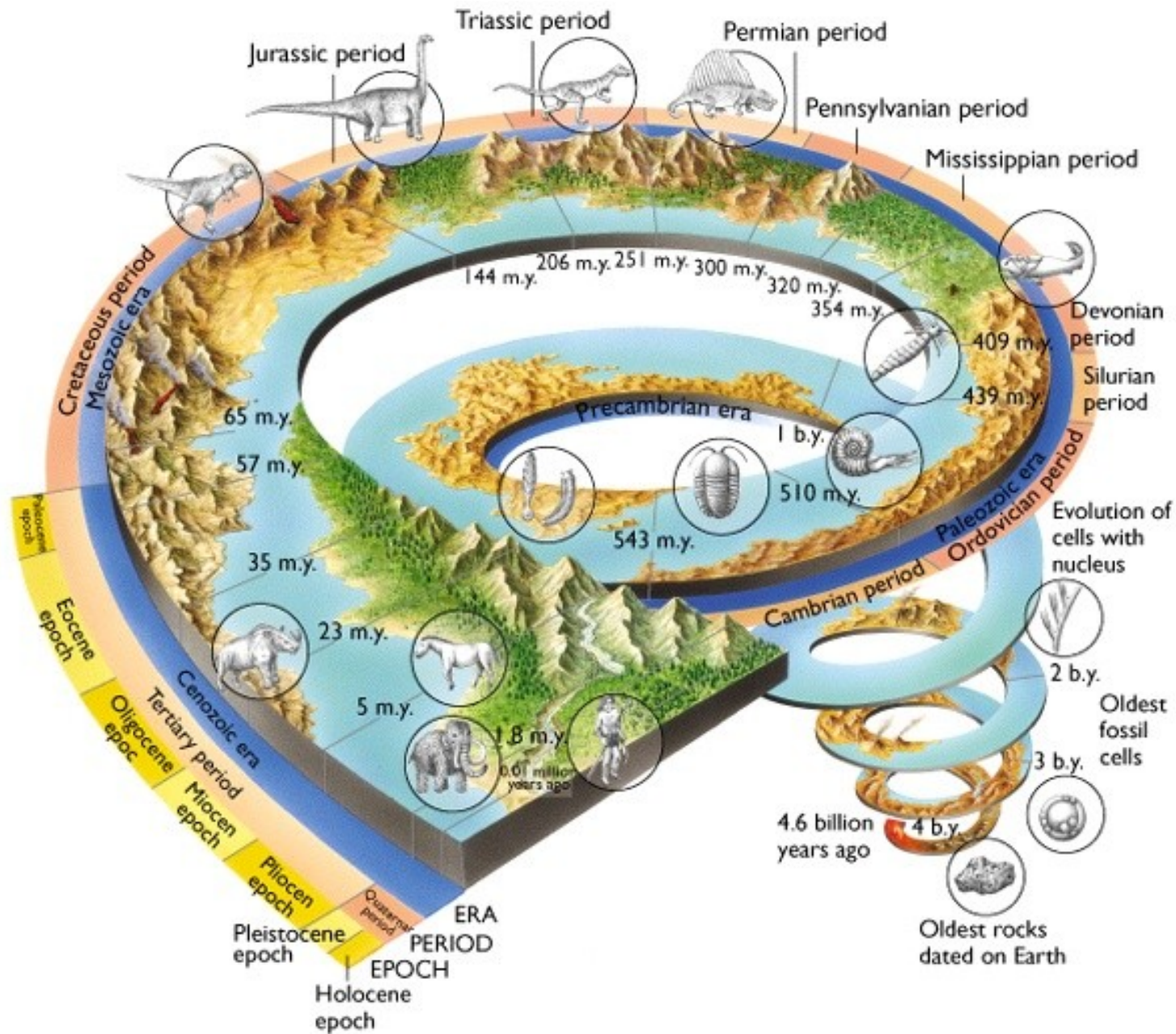
Course Evaluations

- Let's do course evaluations. These will be done electronically on your laptops or those provided by CLT.

History of Life on Earth

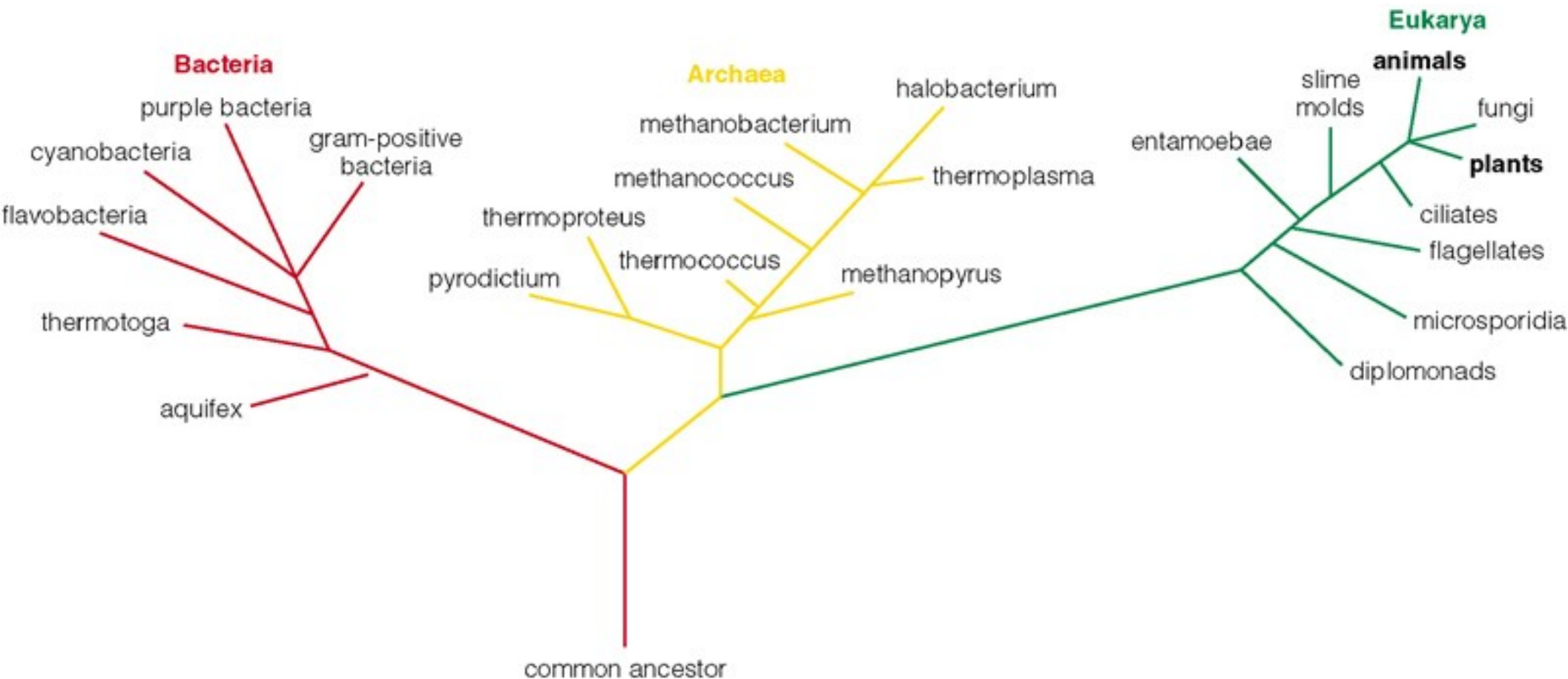


Another View



Evidence of Single Progenitor

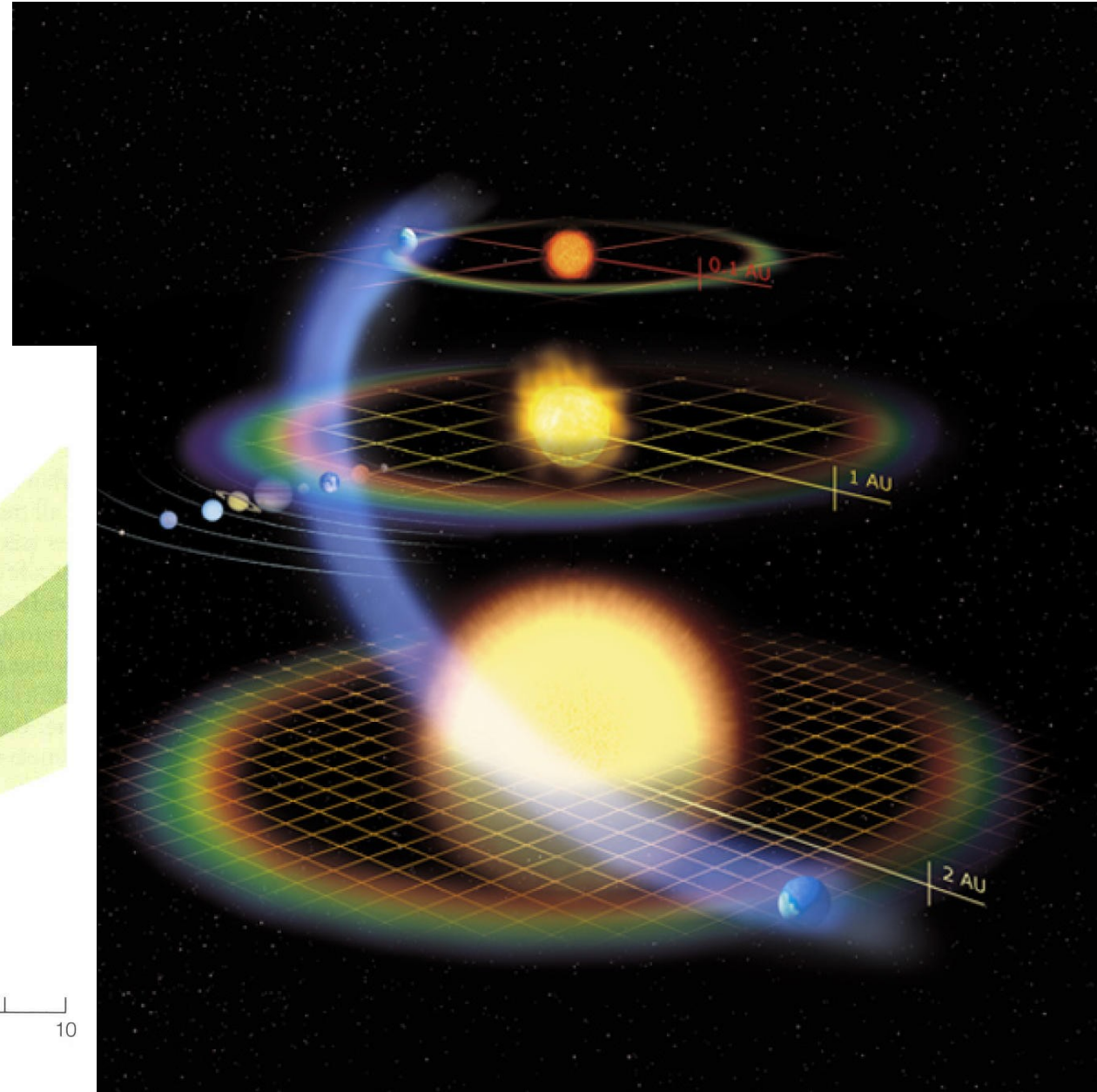
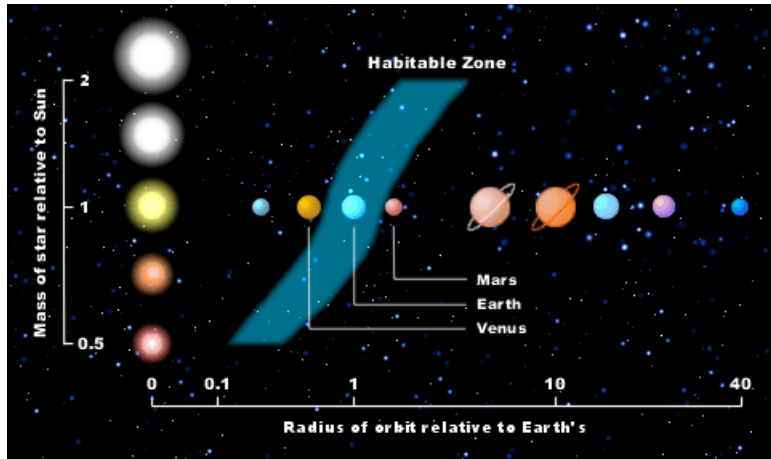
- DNA bases, amino acids, chirality



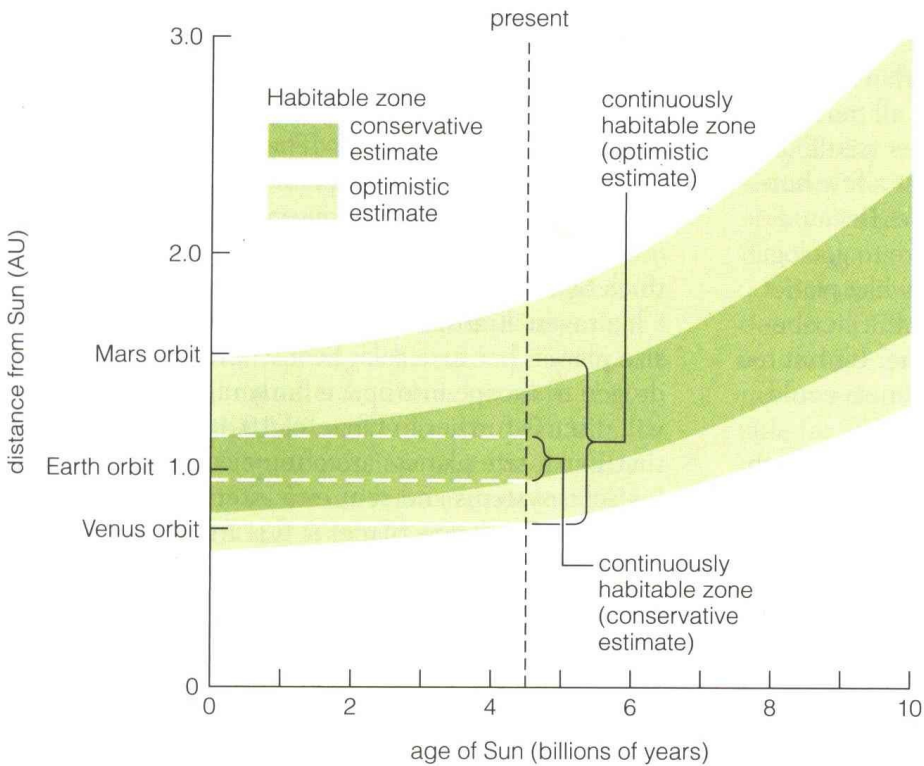
Requirements for Life

- Life could come in many forms, but we will start with the type we are familiar with and what it requires.
 - Nutrients
 - Energy
 - Liquid water
- The first two are easy for any Earth-like planet. The last one appears to be the biggest constraint.

Habitable Zones



The Sun's Habitable Zone Over Time

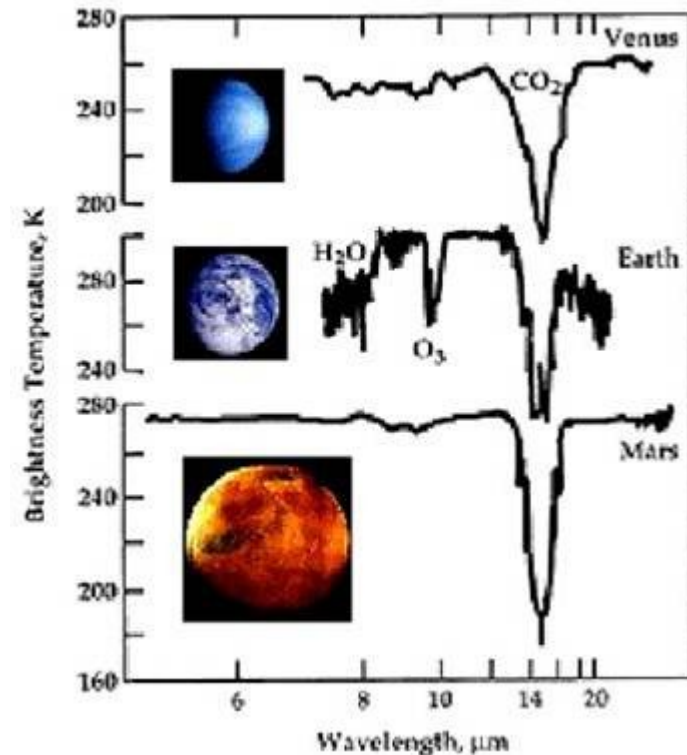


Rare Earth

- There are reasons to believe that the ability to evolve complex life is fairly rare in planets.
 - Right part of galaxy?
 - Impact rates (Jupiter)
 - Climate stability

Detecting Life

- Simple Life
 - Could be detectable through spectroscopy if there are gasses that don't have geological sources.
- Intelligent Life
 - SETI looks for their signals
 - Where are they? (Fermi paradox)



Minute Essay

- Have any questions?
- I'll send out information on the timing of review sessions through e-mail.