

Astronomy 330



HW#7 due tonight.

**Next Week:
Exam 2 Review**

Music: Across the Universe- The Beatles

What About Life?



- Life on Earth depends on two molecules: proteins and nucleic acids
- These polymers are intrinsically linked today
- Making the monomers is easy
- Making the polymers is harder
- Transition to life
 - Protolife
 - Primitive life
- Other life?
- Other solvents? Other conditions?

Presentations



- **Rebecca Marcotte & Ryan Smoot:**
[SPACE COLONIZATION](#)
- **Trent Wright:**
[Life: The Essence of the Universe](#)

Summing Up



- Existence of organic molecules in space implies that amino acid complexity is common.
- Fact: On Earth polymers arose and evolved to life quite quickly.
- Life it seems evolves naturally through a number of intermediate steps if conditions are right and $f_1 = 1$
- But how often are the conditions right?
- Nonetheless, even with only a vague notion of how life on Earth evolved, it seems that there are possible pathways that take the mysterious polymerization to transition to life steps.
- Still a number of questions:

Summing for f_1



- Is life a natural occurring consequence of the laws of nature?
- Will each planet from n_e outgas and produce water?
- Will it have a reducing atmosphere?
- Will it have the right energy sources to produce life's monomers?
- Monomers from space?
- Will polymerization occur?
- Are tides necessary to wash polymers back into liquid water?
- Will basic life occur? Protolife or life?
- Alternative life?
- Maybe the conditions that produced life on Earth are unusual or maybe common.
- That means f_1 can range from small numbers 0.0001 to 1.