## October 12, 2020 MSE 2101 topics

- Extremophiles revisited
- Implications for the possible origin of life
  - Panspermia?
- When did life begin?
  - stromatolites
  - microfossils
  - isotopic evidence
- Where did life begin?
  - shallow ponds or deep-sea vents?
- How did life begin?
  - the Miller-Urey experiment
  - chemical reactions near deep-sea vents
  - organic material from meteorites, comets
  - heat/pressure released during impacts