## December 1, 2014 MSE 2101 topics

- Tidal friction: quick recap
  - remember 4cm/year, 1s/50,000 years?
- Tidal heating as the dominant source of energy
- Io
- Europa:
  - spectroscopy from Earth
  - Voyager
  - Galileo orbiter
- Water on Europa
  - lack of impact craters
  - zig-zaggy terrain
  - magnetic field
  - future prospects: altimetry and radio wave reflections
  - how much water?
- Life on Europa
  - building blocks? liquid? energy?
  - energy for the origin and energy for ongoing life support
- The future of Europa exploration
- Ganymede and Callisto