Introduction to Liquid Crystals

- What do you think is a “liquid crystal?”
  - What is a liquid?
  - What is a crystal?
  - Put them together…
Where is Bucky Badger?
A Liquid Crystal is between a Solid and a Liquid
Motion of Molecules in Different Phases

Solid  Liquid Crystal  Liquid

ORDER  DISORDER
How are liquid crystals formed?

Liquid crystals come about in two ways:
1. Changing the temperature

   - Solid → Add Heat → Liquid Crystal
   - Cool → Liquid

2. Changing the concentration or amount

   - Bar Soap → Add Water → Liquid Crystal
   - Add Soap → Liquid Soap
   - (Bubbles or Soap Scum)
So why are liquid crystals important?

- Liquid crystals reflect different colors of light depending on their direction.
- Direction can be changed by changing
  - the temperature
  - the concentration of the liquid crystal material
What Is Light?

• Light is a wave

Different colors of light have different wavelengths.

• White light = Mixture of all the colors of light
• Different than a mixture of paints and/or other media
Summary

Temperature Change or Concentration Change

Direction of Liquid Crystal Changes

Color (Wavelength) of Liquid Crystal Changes