



# MIT 3.071

# Amorphous Materials

Mid-term Review

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# Glass Science

- What is glass?
- How does the glass network connectivity impact its properties?
- Why some solids tend to crystalize while others form stable glasses?
- Why does glass structure depend on processing history?
- What is the temperature and strain rate dependence of glass viscosity?

## Glass Science (cont'd)

- What is the microscopic origin of viscoelasticity?
- How do we model relaxation?
- Can we characterize glass structure with a single parameter  $T_f$ ?
- Why the practical glass strength is far inferior compared to the theoretical strength?
- What causes glass fatigue?

# Glass Engineering

## Glass Processing

- How is glass prepared?
- How to select an optimized glass composition for a specific application?
- How to shape glass into different products?
- How to strengthen glass?

## Glass Characterization

- What is the parameter used to gauge glass stability?
- How to determine  $T_g$  of a glass?

# Glass Engineering (cont'd)

- How to measure viscosity?
- What are the key metrics quantifying the mechanical properties of glasses and how are they measured?

## Applications

- What is the operating mechanism of PCM and CD-R/W?
- What is the difference between tempered glass, thermally strengthened glass, and chemically toughened glass?

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