

## **Mounting optical elements**

1. Know the requirements:
  - a. Position, 6 DoF accuracy, stability
  - b. Operational environment
  - c. Survival environment
2. Constrain all degrees of freedom  
Systematically check all 6. Extra emphasis on important ones
3. Design for operational environment
  - a. Thermal changes cause shift and stress
  - b. Vibration, dynamic loading
4. Design for survival
  - a. Extreme temperatures should not break or misalign critical components
  - b. Must survive shock loading

### General rules of design:

1. Start with the simplest concept, use rules of thumb and hand calculations.
2. Identify “degrees of freedom” in the design
3. Systematically evaluate important degrees of freedom
4. Perform initial evaluation of manufacture and assembly before investing in detailed models or calculations

### The basic sequence is

1. Concept (you may have several viable concepts)
2. Preliminary analysis
  - Will the concept work?
  - Is this too expensive or risky?
  - Identify open trades to make
3. Detailed analysis
  - Evaluate design degrees of freedom and optimize
  - Detailed design, manufacturing, and alignment plane
  - Full analysis of performance, survival
  - Risk analysis