Homework 2 Due by 5 pm on Thursday, January 29, 2015

☺ Read and understand Greivenkamp pp. 21-30 and Geary chapter 3. If you don't understand something, ask in class or visit me and we'll take care of it. We will discuss much of this material, but you should spend time on your own clarifying the concepts.

1. Zemax OpticStudio introduction

Go to the following URL for an introduction to Zemax OpticStudio (no need to click the "purchase" or "download demo" buttons since we already have software installed):
http://www.zemax.com/products/opticstudio/feature-explorer/user-interface

Click on the following terms in the menu on the left-hand side of the screen to watch tutorial videos:

User Interface:
- Editors
- System Explorer
- Windows
- Help Resources

Optical System Design
- Sequential Ray Tracing
- System Setup
- Optimization

2. Telephoto lens 1st-order design

Use two thin lenses made of BK7 glass to design a telephoto lens (for operation at 0.55 μm wavelength) with a back focal distance of 50 mm, a lens separation of 50 mm, and an effective focal length of 200 mm (telephoto lenses have an effective focal length which is longer than the lens system's physical length).

Enter your 1st-order design into Zemax. Print out the layout and "system" listing. Is the EFL correct (200 mm)? Is the "total track" (length) correct?

3. Geary ch. 4 homework

Use the paraxial ray-trace equations (called PRTE in Geary's book) to determine ray heights and angles at each surface for the singlet lens in Fig. 4.13 see Geary p. 42).

NOTE: in part c), find what is shown in Fig. 4.11 as the Back Focal Distance
(in Zemax this is called the Back Focal Length)

4. Zemax paraxial ray trace

Build a Zemax model for the singlet lens in Fig. 4.13.
Go to *Analysis – Calculations – Ray Trace* and examine the paraxial and real ray trace values. Do the Zemax paraxial ray trace values match yours? Are they close? Why or why not?