DUE: WEDNESDAY FEBRUARY 27, 2008

Assigned reading: Giancoli, Chapter 32, sections 5–8, and Chapter 33, sections 1–4.

MIDTERM ALERT: The second midterm exam will be given on Friday February 29, 2008 in Thimann Lecture Hall 3 from 9:30–10:40 am. The midterm will test you on material from chapters 15, 16, 32 and the first four sections of chapter 33 of Giancoli. This will be a closed-book exam. However, during the exam you will be permitted to consult two 8 1/2" $\times$ 11" sheets of paper of personal notes (two-sided is fine). Feel free to include on this sheet the key formulae and concepts that you will find most useful for working out the exam problems. You should also bring a calculator, as some of the problems will require numerical work.

Practice problems for the second midterm exam will be available next week. The solutions to these problems will be discussed in a special review session, which will be led by the discussion TA, Jeff Jones. This review session is scheduled for Thursday February 28 from 6–8 pm in Thimann Lecture Hall 3.

1. True/false questions: For each of the following statements, indicate whether the statement is true or false. Briefly explain your reasoning (for example, if false, provide a counter-example).

   (a) When a wide beam of parallel light enters water at an angle, the beam broadens.

   (b) A light ray traveling in air can be totally reflected when it strikes a smooth water surface if the incident angle is chosen correctly.

   (c) When light passes from air to water, both the wavelength and the frequency of the light change.

   (d) A photographer moves closer to her subject and then refocuses the camera. The camera lens moves farther away from the sensor or film [cf. Figure 33-18 on p. 878 of Giancoli].

   (e) A diverging lens can never form a real image under any circumstance.

   (f) A dog with its tail in the air stands facing a converging lens. If the nose and tail are each focused on a screen in turn, the nose will have the greater magnification.

To earn full credit on the following problems, you must exhibit the steps that lead to your final result. The graded homework will be based on the clarity of your method of solution as well as on your final answer.

2. Giancoli, Chapter 32, problem 44
3. Giancoli, Chapter 32, problem 48
4. Giancoli, Chapter 32, problem 51
5. Giancoli, Chapter 32, problem 54
6. Giancoli, Chapter 32, problem 66
7. Giancoli, Chapter 32, problem 67
8. Giancoli, Chapter 33, problem 10
9. Giancoli, Chapter 33, problem 15
10. Giancoli, Chapter 33, problem 26
11. Giancoli, Chapter 33, problem 32