DUE: MONDAY MARCH 15, 2010

All homework sets should delivered either to my ISB mailbox by 7 pm on Monday March 15, or to Laura at the final exam review session (time and location to be announced on the class website).

FINAL EXAM ALERT: On Tuesday, March 16, there will be a three-hour in-class exam from 4–7 pm. The exam will take place in our usual classroom (Physical Sciences Building, Room 110). The exam will cover all the material treated during this quarter, which includes Chapters 1, 2, 3, 10 and 11 of Boas. There will be a slight emphasis on the material from the second half of the quarter, but you can be sure that you will be asked to expand something at some point on the exam. During the exam, you may refer to the textbook, the class handouts, solutions to homeworks, exams and practice problems, or your own personal notes.

To receive full credit for the following problems, you must exhibit the intermediate steps that lead you to your final results. The nth problem in Boas from section $a.b$ is designated by $a.b$–n.

1. Boas, p. 502, problem 10.2–7.

2. Boas, p. 505, problem 10.3–3.

3. Boas, p. 505, problem 10.3–8.

4. A symmetric tensor satisfies $S_{ij} = S_{ji}$, whereas an antisymmetric tensors satisfies $A_{ij} = -A_{ji}$. Prove that
$$S_{ij}A_{ij} = 0\,,$$
where there is an implicit sum over the repeated indices i and j (which can take on the values $1, 2, 3$) following the summation convention described on p. 502 of Boas.

5. Boas, p. 508, problem 10.4–5.

6. Boas, p. 513, problem 10.5–6, parts (a), (b) and (d).

7. Boas, p. 514, problem 10.5–12, parts (c) and (d).

8. Boas, p. 514, problem 10.5–14.

9. Boas, p. 517, problem 10.6–15, parts (a), (b) and (c).