

## PHYS 273H - Fall 2013: Honors Project

As a student enrolled in Physics 273H, you will perform independent research on a special topic related to waves. The goal of your research project is to learn in detail about a topic that is not covered in depth in class. At the end of the semester you will submit a paper describing the results of your project, and you will give a 15-minute presentation to the other honors students on your work.

**Project Types:** You are free to decide the scope and style of your project, subject to approval by the instructor. Here are several possibilities:

- Independent reading on a special topic. For this type of project, your final paper should be substantial (15-20 pages).
- Study of electromagnetic waves with differential vector calculus (Feynman Lectures Volume 2, for example), including more advanced homework problems.
- Write a program to do a complicated wave propagation calculation.
- Build an electronic device which uses a resonant circuit, like an AM radio.
- Holography
- Three phase power
- Lasers and quantum optics
- Gravitational waves
- Seismology
- Sound
- Come up with your own ideas.....

**Project Proposal:** Write a proposal for your project, including the type of project and its topic. I will approve the proposal or suggest changes. Your project proposal must include:

- Scope: What is your project about?
- Deliverable: What will be the final result of your project?
- Milestones: Your proposal should include milestones which detail what you will have accomplished before our Phys 273H meetings.
- Grading scheme: Propose a grading scheme for your project, including the final presentation. In total, your project will account for 20% of your final grade in Phys 272H.

**You must turn in your project proposal to me by Friday September 20th.** We will meet to discuss your proposals during class on Monday September 22<sup>nd</sup>.

**Final presentation:** At the end of the semester you will present the results of your project in a 15-minute presentation to the honors students. We will arrange an appropriate time to meet, most likely during exam week. As noted above, your grading scheme should include the final presentation.

**Phys 273H meetings:** We will meet as a group once a month to discuss the status of your projects. We will meet during class (9:00 am) on September 22nd, October 21st, and December 2nd. **You are required to attend these meetings or else credit will be deducted from your project grade.**