

Final Paper Description and Grades for Physics 162
Spring 2016.

(Cosmology)

60% of the the grade will be from homework problems.

You may work together on homework, and discuss how to do it with others. However, you must do ALL the calculations and ALL the write-up yourself. Copying any portion of your homework from anywhere else will constitute cheating, which will have serious consequences if you are caught. Allowing someone else to copy from your homework also constitutes cheating and will have the same serious consequences. DO YOUR OWN WORK!

40% of the grade will be on a final paper/talk.
You chose one of the following options:

Option A: Review paper (7-10 page paper)

Option B: Review talk plus notes (10 minute talk plus notes and bibliography)

Option C: Calculation with talk/written presentation

Physics and Engineering majors typically do not get enough training in written and oral communication, though this will likely be required in any job in industry or academia. So the written portion of the final should be very carefully checked for clarity, grammar, spelling, etc. I grade hard on this aspect of the paper.

For Option A, the idea is a Scientific American level paper clearly explaining to an intelligent lay person some exciting topic in modern astrophysics. The goal of the paper is to get the reader interested in the topic, to maintain his/her interest throughout the paper, to explain things at a level they can understand, and at the same time to be scientifically accurate. This is not an easy task.

I will be looking for:

- *how interesting is the paper
- *how well you understood the subject you picked,
- *how well you expressed yourself; i.e. could the reader/
listener follow?
- *how well you maintained a constant technical level
- *grammar, spelling, presentation, etc.
- *scientific accuracy

Note, copying any portion of your paper from anywhere else is not allowed (except for short passages that should be explicitly quoted and properly attributed). You don't have to reference every idea, but should rewrite all ideas in your own words, unless you include

them in quotes. A few quotes are OK, or even good, but don't go overboard.

For option B, the goal is similar but the talk will be given to the class, with the written part being your working outline/presentation notes and bibliography. The talk must be well rehearsed and well organized. It must last exactly 10 minutes. 10 minutes is a very short time to get across the essence of any topic, so I recommend preparing your material, then giving the talk out loud to yourself keeping track of time, then redoing the the content and technical level of the talk to fit in the allowed time. The talks will be given during the final, which everyone must attend. If more people want to give talks than the available time, I will select those who will give talks (to give a balanced conference atmosphere.)

The paper or talk may be on any topic relevant to the class, but it should be something you are interested in.

Examples: quasars, time travel, gamma ray bursts, black holes, types of galaxies, gravitational lenses, gravitational waves, LISA, FERMI gamma-ray satellite, Hubble space telescope, etc., etc., etc.

You can get the information from books or magazines in the library, from your textbooks, from the internet, or from any other sources. I recommend looking through these to find a topic that interests you. When you have picked a topic, you can ask me for recommendations of where to find appropriate information. You will be required to use several sources (this forces you to synthesize information; one purpose of this assignment.) While the internet can be a good source of information, note that you MAY NOT use exclusively internet sources. I want you to find articles or books on the subject. Also, you are responsible for the scientific accuracy of your writing; if you use incorrect information from flaky websites, you will be marked down.

For option C, you will give a paper or talk as above, but rather than review some subject, you will present the results of a calculation.

Some examples:

- *Computer solution and graphical presentation of the FRW equation.
- *Fuller calculation of some class topic that we skipped over quickly
- *etc., etc.