Oral Presentation Guidelines (10 minutes + 2 for question/answer)

The oral presentations should be given in the format of an American Physical Society talk. The purpose is to clearly present your research results and scientific contributions to other scientists. The talk must be concise; you may be summarizing a whole year's worth of work into 10 minutes. In that short time, you want convince people that you have done good research, and it's even better if they want to learn more about your work, or want to work with you in the future. A good talk has 4 main sections in the following order:

1. Introduction

The introduction has 3 purposes:

1) A clear scientific problem statement, question, or hypothesis: Your audience should understand up front the specific scientific problem you are working on. If possible to do concisely, also include a brief summary of your main conclusion. Your audience will understand you better if they know where your talk is going and what your conclusion will be. A clever problem statement will hint at the conclusion. For example, if you frame your problem statement as a question or hypothesis, try to phrase it so that the answer is positive -- most people will assume the answer is positive.
2) Motivation: You need to get your audience interested in what you do. The motivation may be purely scientific in nature, or there may be practical applications, or both.
3) Background information: The goal is to provide *just enough* information for the audience to understand the scientific significance of your problem statement and what you are doing. You do not need to give an extensive history of the subject or show equations that are not necessary later in your talk. You should also know your audience. For an audience of physics students and faculty, you can assume the audience has a knowledge of lower division physics courses. They likely know more than that, but generally people prefer to hear a refresher of something they haven't heard in a few years than to be totally lost because they don't know what you are talking about. One of the most common mistakes is to use the specialized jargon of your field or research group. You should think about how to explain the important parts of your work to a nonspecialist.

The introduction can vary in length, and the order of the components may vary, and they may even be mixed together. The best organization for the introduction depends a lot on the problem you are working on.

2. Methods

You need to explain the methods used in your research. Even though a lot of research time is usually spent on methods, in a 10-minute talk, this is usually only 1 slide (unless the point of your research is to develop a new method). Focus on the important points of the process; again the goal is to provide *just enough* detail so that people will understand the physics behind what you did, your results, and your conclusions. A talk doesn't have to have all of the details required to reproduce your results like a technical report or publication. If the audience wants to know details of the process, they can ask you during the question and answer section or afterwards.

3. Results

The results are the main focus of the talk, and should present your findings and scientific contribution in a few main figures or plots. Each results slide should have a clear point either in the title or summarized at the bottom of the slide. Most slides will have 1 main plot or figure. Multiple plots on one slide can be okay if one needs information from both to make an interpretation. What is shown in each plot should be clearly explained, and plot axes should be labelled and include appropriate units. In a complicated plot, you can use arrows, circles, text and/or a laser pointer to highlight the important parts. You should explain clearly what is plotted and how the data lead to your conclusion.

4. Conclusions

The final slide of your talk should summarize no more than 3 main points that you want your audience to remember after your talk. These points should focus on your results and scientific contribution; don't just summarize background information or state that you measured something. A good conclusion statement is quantitative if possible, and complete enough sentence to stand on its own (for example. write out the name of

the model tested rather than referring to 'the model'). The conclusion should address the problem statement (If it doesn't, you may want to revise your problem statement. This is okay, as revising hypothesis after analyzing results is part of the scientific process.). Often, research not only answers questions but also opens up new questions. This is a good place to state those new open questions, and how they might be investigated.

Examples: Bad: A pendulum can be used to measure g. (doesn't mention your contribution. In other words, this was already known before you took any measurements, so why did you bother.) Bad: We could not successfully measure g (not quantitative) Bad: The initial measurement of g was high, but the correction gave a result consistent with Hooke's measurement. (Doesn't stand on its own because the correction is not specified. A better conclusion would state which correction to the model was required to obtain agreement.) Good: A pendulum was used to measure g = 10.2+/- 0.1 m/s^2, inconsistent with Hooke's measurement (quantitative, and addresses a hypothesis -- it doesn't matter if the result disagrees with expectations, it should be presented as such. Science advances mainly by understanding why results disagree with hypotheses.)

Suggestions for delivering a good talk

- Practice speaking out loud in front of a mirror and with an audience of friends. Get comfortable with the material so you speak clearly and with authority. Don't speak too fast, or with a monotone.
- Time your talk to figure out how long you spend on each slide. Most people spend about 1 minute per slide.
- Think ahead of time about answers to common questions people might ask. If you get stuck with a question you don't know the answer to, don't be afraid to say you don't know.
- Review your slides and make sure everything on them has a point. Ask yourself: Does this help motivate, address the problem statement, explain results, or lead to conclusions?