Preparing your Student Seminar presentation

As announced in the Course Syllabus, your student seminar is very significant for the determination of your grade (50% total). Beyond thinking through a specific scientific topic of your (first or second) choice, a major goal of this assignment is to help you learn to plan a presentation that both you and your audience will enjoy. This document will provide some motivation for this goal and explains the criteria for grading.

Suggested topics for the student presentations come in a wide variety of flavors: From classical work that led to extremely important discoveries in molecular biophysics (“How is DNA replicated in the cell?”) and classical experiments (Pipette aspiration of vesicles) to more modern theoretical approaches (Repulsion between adjacent membranes due to thermally excited undulations) and state-of-the-art experimental breakthroughs (“Super-resolution” optical microscopy), there is a broad spectrum of topics. **This may require quite different approaches to their presentations!**

1. The first thing you need to consider is **What are the specific needs, what is the knowledge base, of the audience I am speaking to?** – Clearly, the answer to this will be different for the *Meselson-Stahl Experiment* and for the topic covering *Super-resolution Microscopy*. In the first case, you may want to first address the question: *What was the state of knowledge at that time (1955), and why were the revelations of that experiment so exciting (contrasted with the fact that this is probably common knowledge nowadays)?* In the second case, you may have a choice between concentrating on Physics aspects (*What is the Abbé limit and how is it surpassed with new techniques?*) or on Biology aspects (*Which exciting questions can now be solved that were intractable only a few years ago?*). – Put yourself into the shoes of the audience, and ask yourself, what – within the area covered by your specific topic – would I be excited to hear about? The most important rule here: **Be sure neither to bore the audience nor to overstretch their comprehension.** Many topics have a large range of possibilities. **Identify the main issues and make wise choices emphasizing them over minor issues.**

In this context, different topics may require distinct modes of presentation. *Chalk talks* may be very efficient for theory topics but will probably work less well for a topic concerning optical microscopy. **It is your choice which medium you use (free speech, chalk, PPT).** However, be aware of the pitfalls of PowerPoint presentations – it is very easy to rush through much too fast, to overburden the audience (see above) and/or to present endless text blocks that just repeat what you intend to say verbally!

2. Second, avoid “lab slang”. If you have familiarized yourself with your topic for some time, you probably have a vast advantage over your audience. Let them partake in your gain of knowledge by composing a logical sequence of facts that communicates to them the learning curve you have taken. Most important here: **Do not jump between different pieces of the puzzle but rather devise a logical view of the topic as a whole in which one part of your presentation leads to the next in smooth connections.** (Because experience shows that this point is particularly difficult for someone who already works on a related topic in his/her graduate work, we have specifically barred you from presenting a topic that is too close to your own work.)

3. Third, be open to immediate questions from your audience. While most general questions may be (should be) deferred to the end of the presentations, rushing through your topic at high speed and/or insufficient explanation/clarification may require immediate interceptions. This also should give you immediate feedback about how well you are doing on points (1) and (2).

4. Closely related to (3) – and particularly important for PPT presentations – try to keep eye contact with your audience. Avoid “being glued” to your medium of presentation (be it the chalk board or the PPT projection). It is very important that you communicate visually with the listener! Be able to adjust the pace of your presentation based upon what you see in your audience (I see many bored faces – Am I too slow? I recognize a lot of frowning – Am I too fast?)

5. You are required to **provide a 1-page hand-out** to the audience before your talk. Please condense your introduction, the problem, and the main points of the solution (or characteristic strengths and achievements of a new technique, etc.) into bullet points that can be used as a standalone (for example by a colleague that misses your talk) and will also help the audience to follow through. **The quality of the hand-out will be considered in the grading of your talk!**
Here are the review criteria, by which your presentation will be graded.

(A) Correct assessment and logical presentation of the science (40%)
   (1) Comprehension of the underlying problem and its solution
   (2) Technical acuity
   (3) Proper selection of emphasis
   (4) Connection with topics presented in lecture (where applicable)
   (5) Post-presentation discussion with the audience: Response to questions

(B) Quality of presentation (30%)
   (1) Structure of presentation
   (2) Introduction into the problem and/or historic background
   (3) Clear message and/or discussion of results
   (4) Clarity and logic of conclusions

(C) Clarity of the presentation (30%)
   (1) Quality of hand-out
   (2) Pace of presentation
   (3) Awareness of listener needs
   (4) Avoidance of “lab slang”
      (i.e., non-trivial terms that a general science audience might not be able to understand precisely)
   (5) Connection with the audience and response to interceptions