

USTC SNST 2015 Spring Semester Lecture Series

Title: Introduction to Plasma-Facing Component (PFC) and Plasma-Material Interaction (PMI) R&D for Tokamak Fusion Energy

Lecture 3: Room 1617, 930-1130, Saturday April 18, 2015

L3A: How to write paper for scientific and technical journal publication?

L3B: Why most PPT presentations sucks, and how you can make them better (using L3A as an example)?

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We'll cover

1. Prepare a PPT presentation in 6 steps.
2. Improve the L3A slides, as an example

Step I. Work on a PPT presentation only after you know the answers to – who, what, why, how, your answers, and remaining questions

1. Who are your audience?
2. What questions do they want have answered?
3. Why are the questions important? Or, why are the answers of interest?
4. How are the answered obtained? Or, are the methods used credible, reliable, etc.?
5. What are the answers?
6. What are the remaining questions or uncertainties in these answers?

Step II. basic questions of a PPT slide

1. What is the main point of the slide? Put in title.
2. What are the supporting points? Body of slide.
3. How many supporting points. <6; 3-4 even better.
4. Graphics? Only when it is helpful to deliver the information. That is, when “a picture is really worth a thousand words.”
5. Video? Only when “a video is really worth ten thousand words.”
6. Animation, fanciful graphics, etc? No, they detract from the main message of the slide, unless the subject is about animation and graphics.

Step III. Make conclusion slide, first

1. What are the most important message you want the audience to remember? Make this the title of this slide.
2. If this is difficult, what are the most important message and its supporting message.
3. [This usually is a “cop-out”, indicating some lack of understanding of the information. As you work on the slides, the most important message usually emerges.]
4. Put up to 6 supporting points that summarize your answers/results.
5. Do these answer audiences’ questions?

Step IV. Make the results slides

1. Prepare the key results slides, each of which supports one supporting point in the conclusion!
2. If you have more than 6 key results, regroup them to smaller numbers.
3. [Again, this is a “cop-out” for now.]
4. Follow Step II in making each of the slides.

Step V. Make the “how” slide, and introduction

1. List the methods of work used: tools, boundary and initial conditions, assumptions.
2. What do you want the audience to remember about your methods? Make this the title of “how” slide.
3. List the questions you are addressing, why are the questions interesting, and the **title of the conclusion!**
4. Your conclusion statement may surprise the audience – Good. Now you have their attention!
5. [But, it would not be helpful to try to make your conclusion surprising when in fact it is not.]

Step VI. Review entire PPT; remove inconsistencies, clarify ambiguities; correct errors.

1. Note, a PPT presentation can always be improved. So, when is it good enough?
2. Learn from the reactions and questions from the audience.
3. Make a final review soon after the presentation, and make the final improvements for your own record.
4. You are finally finished with this PPT presentation, for a while at least.

An improved L3A to follow.

Any researcher can write an excellent technical paper

1. Question: How to write a technical paper?
2. Why?
 - Publications is a key measure of an R&D career.
 - Excellent method to improve R&D ability.
 - Excellent training to improve communication ability.
 - Important tool in carrying out R&D.
3. A straightforward process is described.

But, a prerequisite: a good R&D is at least largely done

1. This means

- Already answered: What is the question? Why is it interesting? How to find the answer(s)?
- Already found the answers, discovered more questions.

2. Already completed R&D cycles : What \Rightarrow why \Rightarrow how \Rightarrow answers, questions \Rightarrow repeat.

“largely done” suggests that writing the paper is part of the R&D!

Step I. Just start, writing without hesitation nor regard to style and polish!

Write down (from accumulated notes as research progresses)

- i. The questions to be addressed (what),
- ii. The motivation and the anticipated progress relative to what has already been studied by others (why),
- iii. The approach taken to address the questions and the techniques applied to obtain the new results (how),
- iv. The results in concise detail,
- v. The conclusions to gleam out of the most important points of the above, and
- vi. The relevant issues remaining in the form of a discussion.

Step II. Thoughtfully write a concise abstract

1. Focus on the most important information.
2. Make it interesting to potential reader.
3. Helps further clarify the value of your work.
4. Review the draft content of the paper to make sure.

Step III. Work on style and polish

1. Improve the clarity of each sentence.
2. Break up a long sentence into shorter sentences, each containing 1 or 2 ideas.
3. Use a simpler word instead of a complicated word. Use a thesaurus (or Google-Translate).
4. Remove repetition and redundancy.
5. Remove text not germane to the conclusions.

Step IV. Reorganize the paper

1. Reassign sections and section titles for logic flow.
2. Write an appropriate title now to attract with intended readers.
3. Direct the title and organization toward the important results.

Step V. Iterate

1. Retrace Steps II – IV of the draft.
2. Add the references for the first time.
3. Every key idea in the paper that has prior work deserves good reference.
 - Make the referees happier.
 - Speed acceptance of paper.
 - Can take more time than you anticipate.
4. The iterations will move faster each time.
5. Finish when only typos and minor corrections remain.

Any researcher can write an excellent technical paper

1. Process is straightforward.
2. Just do it.
3. Do not worry whether your papers will be good or not.
4. Practice makes perfect..