

Notes on preparing oral presentations for physics laboratory course seminars

Duration of the presentation

In the introductory laboratory course in physics 10 minutes, in the seminars accompanying the advanced laboratory courses (15-25) min. 10 min are not unusually brief: (10 - 20) min time slots are typical of so-called short presentations at scientific conferences.

The duration of the presentation must be verified by holding the talk as an exercise under conditions comparable to those of the actual presentation (speaking aloud while standing, describing transparencies etc.), and measuring the time.

Structure

1. Title, Author(s), Institution / Event
2. Short Introduction stating the goals of the presented experiment
3. Theoretical foundation
4. Experimental setup
5. Presentation of the achieved results
6. Discussion of the results including comparison with the expectations
7. References

Items 3 through 6 are repeated, if several experiments are presented. The number of experiments presented depends on the available time.

Purpose and design of transparencies

The purpose of transparencies is to support the comprehensibility of a presentation by visual aids. This is achieved by using strong headlines, expressing central concepts in keywords, important formulae, graphical presentations and images, or also short movies.

In addition, transparencies can support speakers in adhering to the presentation's structure, in not omitting important content, and in meeting the time limit etc.

The following rules should be adhered to when designing transparencies:

- Using a sufficient font size, at least 20 - 24 point (depending on the font) for headlines, 18 - 20 point for normal text and formulae, 14 - 16 point for remarks such as references. The latter only in the form /1/ or /according to 2/ on transparencies, listing all references on the last transparency. For books in the form: /1/ Miller, E: "Physics", ABC publishers, place, year. For articles in journals in the form: Meyer, E.; Müller, H.: „New Results“, Nature 123 (2014) 100-105¹.
- Use clear sans serif font types such as Arial, Helvetica or Calibri.
- Headline on all transparencies, number transparencies at the bottom on the right in the form n/m (which means transparency n out of m transparencies).

¹ In case of more than three authors only the first three are mentioned, followed by „et al.“ (for „among others“). The journal is cited in the form: *Name Vol.-No. (year) page no.*

- Avoid (lengthy) sentences, use keywords to outline the main ideas. Maximally two lines per statement. Present texts in the form of a list (enumerations) with bullet signs when applicable. No more than 5 items per list.
- If applicable, text and / or images may be displayed sequentially (on click). Do *not* use fancy animations, such as flying words or letters.
- Restrict colored text to the absolute minimum.
- No tables containing lots of numbers – use graphs instead.
- Use sketches and images (rare movie clips) to visualize experimental setups, subject-specific facts and results. The listeners recognize and remember graphs and images more easily than tables or text.
- Captions to graphs (axes etc.): font size should be comparable to the size of normal text.
- Figures do *not* get captions such as: “Fig. 12: Setup for measuring ...”, because they are explained orally when referring to them during the presentation.
- For captions (axes etc.), formulae, the presentation of measurement results etc. keep to the rules applying to written laboratory reports.
- Results of measurements must always be presented including measuring uncertainty, the latter with a maximum of two significant digits.
- Wherever possible, vector graphic formats are preferable to pixel graphic formats. Vector graphics (e.g. “Autoforms” in PowerPoint) can be scaled to any size without distortion. Pixel-based formats, such as photographs and screenshots become blurry when magnified by a (too) large factor. EPS, WMF, EMF are examples of commonly used vector graphic formats, while BMP, GIF, JPG, TIF, PNG are common pixel formats.
- Proof-reading prior to the presentation. Spelling and grammatical mistakes particularly catch the eye on a large screen and take the listeners’ attention off the presentation.

Presentation

- Free speech, without reading prepared sentences off a manuscript or the transparencies.
- If notes are used just to be on the safe side, use cards (DIN A6).
- Short sentences.
- Speak loud, clearly and slowly; about 120 words/minute is a good rule of thumb.
- Address the audience whenever possible. Seek eye contact with the listeners.
- Use a (laser) pointer to mark elements (only *once* per element!) on the transparencies.
- Place a watch on the table/podium to observe the duration of the talk.

Images, sketches, animations, videos

Sources for (mostly) freely accessible images, sketches, animations and videos are e.g.:

- <http://photos.aip.org/> : In particular pictures of scientists and the history of physics
- <http://nobelprize.org/> : Images related to Nobel prizes.
- <http://www.webelements.com/> : Periodic system, images of the elements.
- <http://www.wolframalpha.com/> : Graphs of mathematical functions.
- http://commons.wikimedia.org/wiki/Main_Page : Large media collection including scientific subjects.
- <http://www.flickr.com/> : Pictures taken by amateur photographers, enterprises etc.

Not every image may be used free of charge. However, in a seminar presentation, usage is normally permitted, when the source is referenced.

References

References must refer to acknowledged scientific literature, e.g. to the works listed on <http://www.uni-oldenburg.de/physik/lehre/praktika/literatur/> for the lab courses. Contrary to photographs for instance, scientific data and information may *not* be taken from sources such as WIKIPEDIA or any other similar database created by anonymous authors.

Saving the presentation, hardware and software compliance

- Find out which software and version is available on the laptop computer used for the presentations beforehand. In the introductory laboratory course, for example, Microsoft PowerPoint 2010, Adobe Acrobat Pro 11 and Open Office 3.2.0 are available at present.
- If a personal laptop is used, its compatibility with the projector is to be verified in time before the presentation.
- Save the presentation in a single folder including all images, animations and videos in order to avoid problems presenting certain elements on the laptop used for the presentation.
- Videos can only be displayed, if a) the computer used for the presentation supports the video format, and b) the codec used for encoding the video is available on the notebook as well. A relatively safe choice are "IV32: Intel Indeo Video R3.2" encoded AVI-files. Save the presentation on two separate storage devices, such as a USB flash drive and a CD-ROM, to be sure.