HINTS FOR PRESENTING PAPERS

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It takes at least three weeks
to prepare an impromptu speech.
Mark Twain.

The following is mainly concerned with aspects of presenting oral presentations, but a small section on *poster papers* has been added at the end. It is mainly directed to those that have little or no experience in this. It is to some extent based on similar notes produced in the past by Seth Shostak and Vincent Icke, but to a large extent also on my own observation at international symposia and the like. On those occassions I have seen many presentations that could have had a much larger impact, had the speaker followed some basic rules. If you follow these, you will have a clear advantage.

At the outset I want to make it clear that giving a talk or paper is a thing that needs to be learned. Few of us are natural speakers; most of us make a mess of it, unless we are following some basic guidelines and procedures. ALWAYS TAKE AMPLE TIME TO PREPARE; your future career does heavily depend on how you perform during oral presentations. And don't follow the attitude of some these days that good preparation is a loss of time that could be better used in doing science. Some people seem to think that nice viewgraphs are "sissy" and that their scruffy ones show that they have been working like mad to get their results ready in time for the meeting.

There are five different kinds of oral presentations, namely colloquia, invited papers at conferences, contributed papers at conferences, popular talks and classroom (teaching) lectures. All of these have some specific characteristics and points of attention, particularly relating to their structure. I will treat these specifics after first going into general matters. I will be brief as far as the last two types of talks are concerned.

I. General Aspects.

The most important aim of any presentation is: **YOU WILL NEED TO GET YOUR MESSAGE ACCROSS AND EVERYTHING ELSE IS SUBSERVANT AND DEDICATED TO THAT**. This is lesson number one and should always be remembered! This means also that you have to capture the attention of the audience and should in no way distract the listeners, neither by details or by peculiarities in your presentation. Always use viewgraphs (sometimes also called transparancies; in Dutch, people call them 'sheets', probably because the box in which the manifacturer supplies them, says on the outside that it contains 100 or so *sheets*, just as a box of copying paper also contains so-many 'sheets').

Things that you should keep in mind and should adhere to are:

- Don't underestimate your audience. They are clever people as well. So, don't try to show them how clever *you* are. If you are, they will notice.
- Give credit to others that have worked in the field, especially when they are in the audience. It shows that you have read the literature, and that you do not have the feeling that you have solved by a stroke of genius this important question, that the best minds in the world have for years been unable to (that is seldom the case and you may safely assume that it

does not apply to you). If you are going to prove someone wrong, then do not rub that in or make a fool of him/her; be courteous and let it be understood that it is due to your better data or facilities and not to your far superior intellect.

- Also don't bother your listeners with details that you can suppose they know. It irritates and makes them loose attention. Sometimes it may be useful to mention your result at the start (e.g. if you are describing and applying a method to measure a particular number, such as the Hubble constant). Otherwise, people are getting restless and start wishing you to speed up and get to the bottom line.
- Try not to cover everything and tailor the talk to the occassion and the allotted time.
- If a microphone is available, use it. The cord-less ones don't present any problem. If you feel unhappy being put on a string by a microphone, attached to you and with a cord that restricts your movements, ignore that feeling. You have to be not just heard, but also understood.
- Use a pointer to show on the screen, where you are. But never forget not to turn your back on the audience. If no large pointer (or one of these laser-pens that project a point or arrow on the screen; remember that it takes a steady hand) is available, then you will have to point at the viewgraph itself. Use one of these special telescopic pointers or a sharp pen or pencil, but NEVER your fingers. These are too coarse for that and often you see people just aiming at the viewgraph (holding their fingers a few cm above it). Beware, that in this set-up you may have your body in between some listeners and the screen, especially in relatively small rooms.
- It helps to make a small joke or a pun near the beginning of your talk. It captures attention and also helps you relax. But don't overdo it and be aware that your joke may not go down well. If that happens don't try again: you have missed that one and you should cut your losses. I'll give two very successful examples that I have heard, in order to let you get the flavor. Ken Freeman once did his (everyone had done one in the preceding talks) by saying: *"These are very serious matters, and there will be no jokes and no laughter"* and subsequently could not help laughing along with the audience. Olin Eggen said: *"Although an observer, I will treat some theory. Now, theorists say, when they obtain observations, that they are getting their hands dirty. So I guess I will be getting my mind dirty"*.
- Beware of jargon specific to your expertise. Either define it at the first occassion or leave it out. The same holds for acronyms. Avoid these anyway unless you are under a select group of specialists. In the latter case, the use of acronyms may actually enhance your standing as a person who obviously knows what he/she is talking about.
- Look at the audience. Don't try to direct yourself only to the pundits (it is too begging), but select early in the talk a few persons to look at. These are persons from whom you notice immediately that they are paying attention; you cannot afford to loose even them.
- Decide beforehand what you can afford to skip in case you run out of time. Also plan a short and to-the-point introduction and don't get tempted to mention things by-the-side, certainly not in the early stages. Plan your talk to last at least 10% shorter than the allotted time. If a conference talk, check the program or with the session chair to see, whether the allotted time does or does not include discussion.
- If you do run out of time, don't start to flash those remaining, precious viewgraphs on the screen, that took you so much time and effort to prepare. Skip them. But if some information on them is still relevant and vital, then summarise it verbally in a few sentences.
- While talking, try to keep your viewgraphs in the right order. Afterwards people may want to ask a question and invite you to put up a particular viewgraph again. You should

not waste much time to find it, since otherwise the rest of the audience will loose interest (some persons are only interested to ask their own question and are eagerly awaiting their chance!).

- Don't get upset, when questions are asked along the way; they usually are genuinely for information. If you will cover it later on, simply say so. If you feel that it is going out of hand and that there is a serious threat that you will not be able to deliver a well-balanced presentation in the remaining time, then refer to the chair with a remark such as "I think that this issue should be left to the discussion".
- Your last viewgraph should contain your main conclusions. Leave it on during the discussion. People may still be taking notes. In any case some may be re-reading it and your message will have a chance of even more effect.
- Repeat the question that is being asked. It gives you time to think and the rest of the audience a chance to know what the question is about.
- If a question is asked about something you haven't thought of, admit that. You may even comment that this is a very good and interesting point and in this way you may get away with it.
- If a person seriously disagrees with you and starts to attack your details, try to get this off the floor. Suggest to the chair that these are details that should be discussed outside the session in private. Sometimes the chair may not agree (after all a conference is meant to bring out disagreements and debate them); then take the challenge and take all the time you need to explain your view. Remember that you need to convince the *audience* and not your opponent (he/she will never be convinced by such a procedure and it is a risky conduct in public anyway), so address the audience. You may invite your opponent to elaborate on what you think his/her weak point is, but do this only when you are *very* sure of yourself. There are two general points here. Firstly, scientific progress usually is brought about by controversies and your own status depends much more on how competent you are coming across than on whether you are proven right in the end. Secondly, you are not doing anybody a service by publicly humiliating another person; not even yourself.
- If you expect questions on particular details, be prepared and do have viewgraphs on obvious points like that ready.

II. Viewgraphs.

Viewgraphs play an important role. For yourself they serve as a means to keep the flow in your story, while you don't need to have to look at notes all the time. For the audience it helps in many ways. It helps them in taking notes, in catching up when they have been taking notes or have been thinking about something you just said (or temporarily have lost attention) and in getting a bit ahead of you in case you elaborate on something they already know. Use slides only for half-tones that are difficult to reproduce with the copying machine or cannot be produced directly as viewgraphs.

- Prepare viewgraphs preferably with a computer program, such as TEX or LATEX. Beware though that the printer and the copying machine produce excellent contrast.
- If you need to prepare them by hand for one reason or the other, then write large letters (I recommend using capitals only). You may use various colors, but too many or use without a clear purpose distracts.
- Never use more than 8 to 10 lines per viewgraph. Use the *itemize* (with bullets) or

enumerate macro's of LaTeX whenever you can. Also use short sentences (unless you are giving a quote from someone else; in that case do read it out aloud and don't let the audience just read it).

- DON'T EVER USE AN OPAQUE SHEET TO COVER THE PARTS OF THE VIEWGRAPH THAT YOU HAVEN'T REACHED YET. This *"strip-teasing"* is a prime example of *"contempt of audience"*. It is a vital matter and could be a most serious mistake. You may feel tempted to take the audience by the hand in guiding them through the uncharted territory with you as a guide. But they may have been there before! If they read ahead of you (because for example they know the part you are currently explaining already) the next thing at the minimum gets recorded in their mind and you have won an advantage when you get to it. Otherwise they may be wondering what is on the unexposed part of the viewgraph and you have lost at least part of their attention. As with most things there are exceptions, for example if you intend to end with a carefully thought-out punch line. However, in most cases one could simply put such things on a separate viewgraph. Again, never forget that at least a part of the audience is at least as clever as you are.
- Never show large tables with lots of information not directly germaine to the point you are making. Sometimes histograms are a good way also, but never forget most people will be willing to note down some numbers (e.g. percentages) and don't let then have to eye-ball area's or heights in your graphs. For this reason so-called pie-charts only serve a limited purpose and should be avoided if possible (although you may use them sometimes in publications or poster papers). The disadvantage of these is that they are complicated in the sense that the area displayed by each sub-group catches the eye, while people want to know what subgroups are present and what their percentage contributions are. These are usually added in small print and are secondary eye-catchers. The actual percentage is at least as informative (and certainly more quantitative) as the part of the area of the pie cut out by each category.
- Limit the use of mathematical equations to what is really necessary. Don't give the impression that your subject is "clever-chaps-stuff". Algebraic derivations seldom serve a purpose, and may even have the undesirable effect that the impression is made that you are trying to impress the audience. Even if a derivation took you a long time and much effort, present it as: *"Elementary, but somewhat tedious algebra then reduces this to ..."*. However, remember that equations may be very instructive. But do display them in large print and use them for a purpose (e.g. to show how your observables can be used to derive properties or to illustrate the underlying physics).
- Avoid large amounts of unnecessary or duplicating figures (such as optical contour maps in many colors). When showing figures, give people time to digest them. But do illustrate with figures whatever you can and avoid a large succession of viewgraphs with text. Graphs should not be too complicated or (very important) contain information that is not relevant to your story (that again distracts). It is better to re-do the graphs than to use ones you have available, but that do contain other parameters. If you have a graph with a few panels (never more than 4 anyway), of which you are using only one, then cut this one out and enlarge it on the copying machine. This is better than covering the ones you do not need.
- Show a "typical" observation, model or numerical simulation only if you want to use it to make a point (such as a believable signal-to-noise).

III. Structure of the talk

In broad outline each talk should have the following structure.

- *Colloquium.*
  - Start with a viewgraph giving title and your collaborators.
  - Give a bit of history to set the scene and pose the problem you are going to address.
  - Show on a viewgraph the sections of your talk. Refer to that whenever you go into a next section, while you take a short break, e.g. by taking a sip of water or reorganising your viewgraphs.
  - Sections could be: observations, numerical experiments or model calculations; data reduction or method; results; comparison to others; comparison models and observations; discussion and future work.
  - Conclusions presented on a clear and concise viewgraph.

  Remember that a colloquium is a talk where you can explain in detail what you have done, as in a paper. You may be at an institute where similar work is done; then do describe necessary and interesting aspects of your approach, but never leave the impression that they are only secondary players (merely supplying information to the major players such as you) that have been waiting for a fundamental breakthrough that you are about to reveal to them. If at an institute working mainly in other or even related field, take time to explain particular issues that experts would take for granted.
- *Invited review*
  Generally as above, but do discuss not only your own work. You are supposed to summarise developments in recent times. On the other hand, do not shy away from highlighting your own contribution without ignoring work by others. Remember that you have been selected to give the review because of your own work. Concentrate on recent work (of your own and by others known to you either by preprints or private communication; in the latter case you will need permission to show the results).
- *Contributed paper*
  In this case you usually only have very limited time (often as little as 5 or 10 minutes). The structure of your talk should be adapted to that. There is no time for any detailed discussion, but if you present your talk well, interested persons will come to you afterwards for that. The most important thing is to let people know that you have an interesting result that should not be ignored.
  - Start again with title, collaborators and briefly describe the scientific question.
  - Now mention your conclusions. This is after all what you would like most to get accross. It is better to show it early on than to have to cram it in at the end, when you may be running out of time.
  - Use whatever time is left to fill in the most important details.
  - When your time is up, put up again your viewgraph with conclusions.
- *Popular talk*
  Use the structure as in a colloquium, but remember that you are talking to laymen. So, spend more time on posing the problem and its history and explain details along the way. In this case *you* are the expert. In this case you should at the start state that you expect the audience to ask questions during the talk; if they don't you should wonder whether you have been sufficiently clear.

- *Teaching*
  Most important to remember here is that you now are taking students to territories, where they have not been before. They expect you to be the one who knows the way, without whom they will get lost and they are eager to learn. Of course you should now go into details and into mathematical derivations. Again invite questions during the presentation and regularly check yourself by asking a question that can show whether the students are still with you.

IV. Poster papers

There are a few things to keep in mind. Most important is, that your poster is usually one among many and that people are looking at it in between session, when they are tired from concentrating on listening. A good poster can easily be much more effective than a 5-minute contributed paper, so spend as much time as possible in preparing it. Some specific points are:

- The title should be very large and concise.
- There should be not much text, but mostly figures with explanation.
- A catchy ("sexy") graph or picture should figure prominently. This and the title serve to invite people to come closer to examine what they have been observing from a few meters distance. These parts are used by each person to make from such a distance a selection of which posters they will look at in detail and are interesting to them in the first place. Nobody will read all the posters. Much text will discourage them.
- Position yourself near your poster during the poster sessions. Do not wait untill people talk to you; explain or offer further details on your own initiative. But don't insist; some people prefer to be left alone reading posters.
- If you have written up the research, leave a stack of preprints. Otherwise (or if you run out of preprints) attach a piece of paper, where people can write down their names and addresses to be sent a preprint later. Always prominently display your e-mail address.
- Never simply pin the pages of a preprint to the board.
- Remember that even if people are indeed coming to see your poster, this does not necessarily mean that it has been effective.

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