

## **Graduate Colloquium Recommendations**

Since September 2006, it has been required by the Department of Mathematical and Statistical Sciences that all graduate students in thesis-based programmes make at least one presentation to the graduate colloquium. This was put in place not only to make sure that students had some presentation experience, but also to encourage interest in areas of mathematics other than your own. Some of the greatest mathematical discoveries have arisen from the realization that areas of math seemingly dissimilar are actually closely related.

The ideal colloquium talk presents the audience with a clear understanding of the perspective of the presenter. The inexperienced listeners should be able to understand what fundamental questions form the basis of your specialty. Those whose research is similar to your own should be able to understand what questions you are trying to answer within your specialty.

This is no easy task, so the Graduate Colloquium Organizing Committee has assembled these recommendations, which have been greatly influenced by [M],[G] and [dV]:

### **What to present:**

When selecting material to present, try to choose topics that contain the most representative ideas of your field with as few details as possible. This is difficult to do, but it makes it much easier to create a presentation that your audience will be able to follow and get the most out of. Try to find material that lends itself to examples, history and applications. If it's difficult to find examples for a topic, try to find examples that motivate the ideas, even if the examples are not precise. These are key ingredients for a presentation, as they keep the audience's attention. Also, if you feel that a proof is crucial to include in your presentation, try to keep it short (less than 5 lines), and remove any unnecessary details. If a proof is not essential, don't include it.

One common assumption that presenters make is that if their presentation is not sufficiently technical, people will assume that their research is not sufficiently advanced. This is completely false. A colloquium should not be confused with a seminar, where more detail is expected and the audience is expected to have more familiarity with the research area. Instead of focusing on technical elements, try to explain as much of the history and motivation behind your area as possible. This will help to ensure that your presentation is accessible and maintains the interest of the audience.

If your research area involves a lot of background material, don't be afraid to restrict the scope of your presentation to a sub-topic that will be much easier to explain in 50 minutes. Even though you may feel that your presentation is incomplete, it's much better to leave the audience with a concrete understanding of a limited amount of material. Remember, the point of the colloquium is not to create a room of experts in your field in 50 minutes, but to provide a brief introduction that will foster interest in those who wish to discover more.

The concepts you present at the graduate colloquium need not be original work. It is understood that many of the presenters will not have reached a point where they have

complete results yet, or even a well-defined research project. This should not be a barrier to people who want to speak at the graduate colloquium. You may present at any stage of your research project. It is perfectly acceptable to present a general introduction to your field.

### **Who to present to:**

The most common audience member at the graduate colloquium is a first year graduate student who does not study the same area of mathematics as you do. Before preparing your presentation, try to make an honest assessment how much the average graduate student knows about a discipline other than their own. For example, most graduate programs in mathematics at the University of Alberta don't require a course in group theory. This means that if your planned presentation material requires some knowledge of groups, be sure to introduce the definition of a group and be careful about how much group theory you introduce during your talk.

There are many different suggestions about how much of your presentation should be easily understood by what portion of your audience. Many students use the opportunity of the graduate colloquium to practise their candidacy exam or thesis defence, which are supposed to be 10-20 minutes in length. We recommend that students who are using the graduate colloquium for this purpose spend 30 minutes discussing material that should be understandable to a first year graduate student, and then the last 10-20 minutes on their exam presentation. This ensures that the presenter gets to practice their exam presentation while the material is accessible to the audience at the same time. For students who are not giving a practice talk for an exam presentation, we recommend that the first 25 minutes still be accessible by a first year graduate in an area other than your own and the second 15 minutes be accessible to a graduate student in your general area (e.g. pure math, applied math or statistics). Some more technical topics can be presented in the final 10 minutes, but don't forget to finish with a summary of the material presented to reinforce the topics that are central to your presentation.

Finally, don't feel the need to raise the level of presentation to the experts in the room. Specialists who attend colloquia understand that the main purpose of the presentation is not to brush up on the latest advancements in their area, but to generate interest among a diverse audience who may not be as familiar with the material.

### **How to present:**

Everyone has his or her own style of presentation, and no one style is better than any other. Regardless of your own style, there are some universal hints to make your presentation easier to follow. If possible, start with a central question or idea that is accessible to the entire audience. This gives everyone a common starting point and direction to develop from. For example, Hannah McKenzie's talk on October 22 had an abstract that started with the line, "The net reproductive rate of Influenza is 2-3 (Mills and Lipsitch, Nature 2004). With flu season upon us, should you be worried?" While not everyone will immediately know what a "net reproductive rate" is, everyone is familiar with the flu and can understand why it's important to measure how quickly it reproduces. Also, during your presentation you can

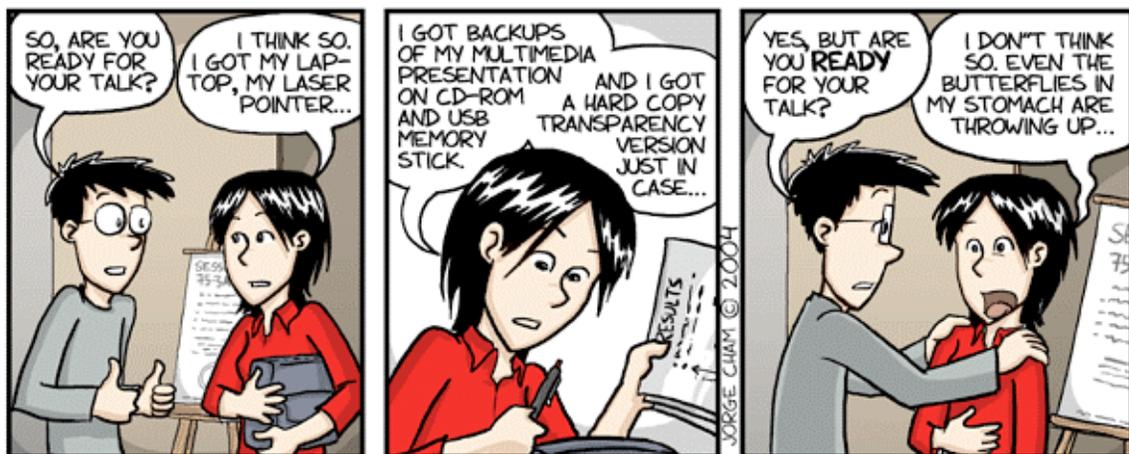
repeatedly summarize and try to include how your current material relates to the original idea that you started with.

Eliminate details whenever possible. One place where this can be done is in the hypothesis of theorems. For example, if a theorem requires a function to be  $C^\infty$  and you're not sure that the audience knows what  $C^\infty$  means then state that the function should be "nice" or "smooth". Only introduce technical definitions when absolutely necessary. Ideally, for every definition you introduce, include an example and a non-example.

If you use slides (such as Beamer, PowerPoint, etc.) for your presentation, restrict the amount of material you try to cover on each slide. Each slide should contain no more than 5 minutes worth of lecturing material. Only use full sentences for critical points that are central to your presentation. If you use a full sentence on a slide, it should be the only idea on the slide, and you should discuss it thoroughly. Also, if you need to refer back to a previous slide in your presentation, duplicate the slide where you need it to appear rather than searching through previous slides to find it again. This is disruptive to the flow of your talk and can cause the audience to lose focus.

Although it is becoming less and less frequent, consider doing your presentation without relying on slides. This not only helps to control the tempo of your presentation, but it also helps prevent 'visual overload'. Instead of putting all of the information you intend to present on slides, focus on including those diagrams or pictures that it is impractical or impossible to draw on the whiteboard. When using the whiteboard, don't be afraid to leave important information up on the board so that it can be referred to later on in the presentation. This helps the audience stay focused on your theme.

### Practise:



“Piled Higher and Deeper” by Jorge Cham, [www.phdcomics.com](http://www.phdcomics.com)

Finally, no matter what presentation format you use, make sure you practise. A colloquium talk is not easy to deliver, and it is essential to be well prepared before you present. Give

yourself an opportunity to run through your presentation a few times, perhaps even once in the room where you will be giving your talk to get used to the layout. Get used to the electronic controls in the room, and test out the sound equipment to find the correct settings.

For more detailed guidelines, you can consult the following references:

**[M] How to Give a Good Colloquium**, John E. McCarthy, *Canadian Mathematical Society NOTES*, 31 no.5, Sept. 1999, pp 3-4 ([www.journals.cms.math.ca/Notes/](http://www.journals.cms.math.ca/Notes/)).

**[G] Advice on Giving a Good PowerPoint Presentation**, Joseph A. Gallian, *Mathematical Association of America HORIZONS*, Volume 13, Apr. 2006, pp 25-27 (<http://www.d.umn.edu/~jgallian/goodPPTalk.pdf>).

**[dV] Mathematicians Must Speak: The DOs and DON'Ts of Giving Effective Mathematical Presentations**, Gerda de Vries, *GAME Teaching Seminar*, Sept. 2007.

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