Today, we’ll look at some ways to enhance the communications value of your slides and some tips to avoid humiliation.

The standard software for most scientific talks is MS PowerPoint. Like it or hate it, that’s what nearly all AV systems at conferences are set up to use. If you are determined to be an iconoclast and use some other presentation software, fine, but be prepared for last-minute technical difficulties that will annoy your colleagues and cut into your presentation time. If you demand to use something other than PPT, take a PDF version of your talk that you can use when the computer in the seminar room can’t run Photoshop or LibreOffice.

Alexei Kaptarev’s Death by Powerpoint is an Internet classic not to be missed: http://www.slideshare.net/thecroaker/death-by-powerpoint/
This slide is a horrible example—**do not** present slides that look like this at your talk. It has way too much text and zero visual interest. It tells your audience “I might be able to be more boring, but I frankly don’t think it’s worth finding out for the likes of you.”
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A common error that beginning researchers make is that they emphasize what they found most interesting, or what they spent the most time doing, and not what the audience wants to know.

Know thy audience! It’s absolutely critical to producing a successful talk or paper (or anything else).

- Why is the person attending your talk?
- What is her motivation? (What does she want to know?)
- What do you want him to learn? to believe?
- What do you need to tell her so that she can understand?
- What is likely to confuse him?
- What will she likely object to? What counterarguments will she raise?

The amount of time you’re allotted determines how much material you can cover in your talk.

It takes about 8 to 10 minutes to adequately introduce, explain, and summarize one major idea or point in a scientific talk.

You cannot present 16 major ideas in a 15-minute conference talk, no matter how fast you talk.

N.B. This equation is also about as complicated as anything you’d want to show in a talk. Think about how long it took you to process and understand the point that was being made in this slide, using an equation. Do you really want to tackle

\[ \frac{\partial f}{\partial t} \bigg|_{\text{coll}} = \iint g(p - p', q) [f(x, p + q, t) f(x, p' - q, t) - f(x, p, t) f(x, p', t)] \, dp' \, dq \]
A talk is not your paper projected onto the wall.

Your job as a speaker is to thoughtfully select the important points in the paper and convey them in a way that is meaningful and memorable for the audience.
The amount of time you’re allotted also determines the number of slides you should prepare. In general, allow at least 2 min per slide, and more time for slides that present equations, plots, complex figures, or tabular data.
The introductory material flows from these ideas:

- What motivated the work? How does it fit into work that has already been done?
- What background information does the audience need to understand these points?

The body of the presentation also flows from these ideas:

- What supporting evidence and data must be presented?
- How can you most effectively present those data—in text, figures, graphs, equations?

N.B. In most cases, “text” is the worst way to convey scientific data.

For a wonderful introduction to how to present quantitative information, see Edward Tufte’s *Visual Explanations* (Cheshire, CT, Graphics Press, 1997).
Follow some simple “rules of thumb”:

If you’d write or draw something on the blackboard or a piece of paper while explaining your ideas to a friend, make a graphic of it.

Allow about 2 minutes per slide.

Allow more time for the audience to “process” slides that present:

- Equations.
- Complicated schematics.
- Numerical data in tables or graphs.

Back-up slides; consider likely questions or objections and make a slide to answer each of them. (Knowing your audience includes anticipating what questions they’ll ask.)

Allotted <20 minutes? **Make fewer slides**, don’t talk faster.
These key sentences encapsulate your whole talk; they provide the motivation, describe the methods, highlight the key results, explain your conclusions.

Arrange the key sentences, one per slide, and move them around until you have a logical, coherent narrative story line.
Every other element that you put on the slide should explain or amplify the motivating statement

People read slides from top down, and they’ll look at the statement at the top of the slide first. Make it state one of your key points. People pay the most attention at the beginning of the slide. Keep them engaged and interested by what they look at next. Make it the supporting evidence for your statement.
Don’t use photographic or “fill” backgrounds

- They’re distracting to the audience
- They make your text too hard to read

Even if your talk is about koalas
Even if it’s on hydrophobic materials
Even if you think it looks really cool

Just don’t do it!

Don’t use photographic or textured backgrounds—just don’t do it. They’re distracting, they get boring after you’ve seen the first one, and the superimposed text is often impossible to read on them.
Don’t use one of the PPT templates
They take up too much real estate with meaningless graphics
They force you to devote 25% of the slide to the “title”
They trivialize your message by promoting style over substance
Many are just butt-ugly

You want the audience to be thinking about what you’re saying and looking at the evidence you’re presenting, not swooning (or snickering) over your artistic taste.
Put a motivating statement at the top of your slide that summarizes the point of the slide.

People pay attention when something changes in their environment—for instance, when a slide changes. Take advantage of that sharpened attention to articulate your message in an immediately identifiable, memorable way.

Use the rest of the slide to explain, give evidence for, or provide examples of the idea presented in the motivating statement at the top of the slide.
The default for PowerPoint slide “titles” is centered. Change it to left-justified.

Turn off the automatic “fitting” functions in PPT to avoid having PPT reduce your font size if you exceed the number of characters MS thinks you should have on a line.

In PPT 2010, right click inside the text box, then select “Format Shape” from the drop-down menu. In the dialogue box, click on “Text Box” on the left navbar, and then turn on the “Do not Autofit” radio button in the “Autofit” section.

In PPT 2013, from the “File” menu, click on the “Options” link, and then select “Proofing” from the menu. In the dialogue box, click on the “Autocorrect Options” button. When that dialogue box opens, uncheck the “Autofit Title” and “Autofit Body Text” boxes.
I recommend turning off the “bullet list” format, which is the default in PPT. Presenting ideas in bulleted lists implies hierarchies or relationships that may not, in fact, exist.

“Lists can communicate only three logical relationships: sequence (first to last in time), priority (least to most important, or vice versa), or simple membership in a set (these items relate to one another in some way, but the nature of that relationship remains unstated). A list can show only one of those relationships at a time.” Gordon Shaw, Robert Brown, Philip Bromiley, “Strategic Stories: How 3M is Rewriting Business Planning,” Harvard Business Review 76, 42–44 (1998).

Turning off the bullets also gives you more slide real estate to work with.
While a spectacular and captivating photo (of a vapor cloud forming around an F-18 Super Hornet as it approaches the sound barrier), this image has nothing to do with cooling schemes for gas turbine engines. Instead of explaining or amplifying the talk, the photo competes with it.

Anybody going to this talk probably already knows what a jet airplane looks like. All this image does is distract the audience from the information the speaker is trying to convey. Who wants to pay attention to the boring, dense text when they can try to figure out what kind of fighter jet this is and why a vapor cloud is forming around it?

This slide also illustrates a problem with presenting information in bulleted lists. The narrative text all runs together.
Here’s how to improve this slide:

Change the centered title to a left-justified statement.

Turn off the bullets, “hanging indent” the text, and add extra space between items to make the text easier to read.

Write short phrases, not full narrative sentences, to make the text easier to read.

Change the interline spacing to make the text more compact, which allows more text per vertical inch and more inter-item spacing. On the “Paragraph” section of the ribbon, click on the down arrow to open the dialog box:

Then change the spacing to “Multiple” and type 0.9 in the box.
Here’s the “before” and “after” versions of the slide. Which do you think does a better job of informing, educating, and persuading the audience?
Never *ever* put *anything* on a slide that you do not thoroughly understand.

That figure you got from somebody else and added at the last minute...
...will be all the audience asks questions about

And don’t put anything on a slide that you don’t explicitly talk about, either!

By the same token, don’t put anything on a slide that you don’t explicitly discuss in your talk.
Choose an easy-to-read font (40 pt)

Make sure your audience (36 pt)

Can easily read (32 pt)

Every one of your slides (28 pt)

From the back of the room (24 pt)

See what I mean? (14 pt)

Tip: The bigger the room—the bigger the font

When you are first setting up your talk, use the “Master Slide” to automatically format text on all slides.
Do as I say, not as a do. This slide, while typical of an academic lecture to facilitate note-taking, has \textit{w-a-a-a-a-y} too much text on it for a science talk. Keep text to a minimum—use just enough words to orient the audience to what they are seeing. You want them to be listening to you, not reading a novella off the screen.
Every computer has its own individual “library” of fonts; if PPT cannot find a font when you open your presentation on a different machine, it just arbitrarily substitutes a font that it thinks is “close.” Often, it isn’t...
Choose a neutral background and a high-contrast color for the text

- Use a light-colored background with dark text
- Use a dark background with light text
  - This isn’t high-enough contrast
  - Neither is this
  - Don’t ever put red on blue
  - Or blue on red
  - And avoid using gradient fills, too

Be aware that colors that look bright and crisp on your monitor may look entirely different when projected. In particular, pastel colors and thin lines fade away. Use bright, primary colors, bold fonts, and thick lines.
If you use color to convey information, make sure that information transfers as you intended it and is accessible to everyone in your audience.

Another good resource is http://www.colourblindawareness.org/colour-blindness/.
What about captions? Every figure in a paper must have a caption that explains the figure and points out important features. Some scientists say that figures for talks don’t require captions or labels—you’re standing there explaining them, after all.

I, however, think images in talks should have short, explanatory labels that orient the audience. They’re going to look at the picture on the slide first—before you explain it—and they’re going to want to know immediately what is being depicted.

If you’ve used somebody else’s figure, you should at a minimum give credit for it, and perhaps provide a URL or bibliographic reference for where the original may be found.

Another tip for ALL figures—if you show a photograph or drawing of something, provide some sort of visual clue to its scale. The audience may have no idea if the apparatus shown below is 5-cm long or 5-m long from just looking at this image.
PowerPoint animations can be useful in presenting equations:

- Highlight relevant terms in different colors
- Drop out terms
- Replace symbols with words
- Blow up parts of the equation or use arrows as pointers as you walk the audience through it
See http://www.cracked.com/article_16335_7-innocent-gestures-that-can-get-you-killed-overseas.html. The examples are quite true, but the language is a bit too colloquial for this straight-laced Midwesterner. Read at your own risk.—cme
Do not use jargon unless you explain it (What is SPH, anyway?).

Choose the simplest words—imagine that you are giving a talk in English to people who don’t speak English as a first or even a second language. In science, you probably are!

If English is not your first language, do not be embarrassed to ask a native speaker to review your presentation.

Practice speaking slowly and distinctly, whatever your first language is.
The summary slide lets you reiterate your key points and cues the audience that you will soon be taking questions. Leave it on the screen during the “questions” period—it will help people review what they’ve learned and remind them of questions they want to ask.

Add your contact information at the bottom of the summary slide; people may not remember it from your title slide.
Practice your timing—you will get cut off unceremoniously at conferences.

Ask if the session moderator will give you a two-minute warning if there's no time-keeper. Put your watch or cell phone on the podium where you can see the time.

Do not compensate for having too much material by trying to talk faster—

Simplify.

Cover fewer points.

Eliminate slides.

Think about the importance of each slide. What if, for some reason, your talk must be shortened by five or ten minutes? What slides would you take out?

Use the “hide slide” feature in PPT to easily remove slides.
Before you leave for the conference, email an editable copy of your talk to yourself, at an address you can get to from the road

Laptops fail
Thumb drives get lost
Files get corrupted
The person who was supposed to load your talk on the seminar room’s computer gets sick or forgets

Take along a printed copy of the “notes” pages, too. Use them to rehearse on the plane. Mark where the animations occur.
Arrive ahead of your appointed time. Don’t dash in at the last minute, panting and out of breath, in your coat, umbrella, galoshes, backpack, juggling a bag of exhibit-hall geegaws.

Check everything before your talk.

Check the projector:

   Make sure you know how to turn it on.
   See that it is plugged in and accepting the signal from your laptop.
   Adjust the focus.

Check microphones, pointer, other tools.

If a clip-on mike is used, make sure it is fastened securely, check the volume, and then leave it alone.

Arrange your slides, notes, and other materials so you can reach everything without fumbling.

If the battery on your laptop dies or the bulb burns out on the LCD projector, can you still give your talk? (Here’s where the hard copy of the notes pages are essential.

Do not expect the conference organizers to take care of all of your needs if you do not tell them what they are ahead of time. Did you request an overhead projector? Slide projector? An adapter for your Mac?

TURN OFF YOUR CELL PHONE!!
The day of your talk is not the day to try out your new thong underwear or strapless underwire bra.

Wear comfortable shoes.

Wear a shirt or blouse that you can clip a portable microphone to, so that it is positioned about 5–6 in. below your mouth. Turtlenecks and tee shirts should be avoided, because there’s no good place to clip the microphone where it won’t slip.

Wear slacks or a skirt with a waistband or pockets for the microphone’s power supply.
Handling questions is an essential part of giving a talk

Don’t be nervous—think of it as a discussion among colleagues

Always repeat the question

What if you don’t know the answer?

If the questioner disagrees, don’t argue

_Never_ insult the questioner

If the question is off topic, deflect

Always repeat the question (summarize or paraphrase it) before you plunge ahead with your answer. Not everyone may have heard it, and repeating it not only allows the questioner to clarify if you’ve misunderstood, it also gives you a few precious seconds to think about your answer.

If you don’t know the answer, don’t bluff! Simply say, “That’s an excellent question. We haven’t looked at that.” or “I’m not sure; I’ll have to think about that.” It’s okay not to know the answer; it’s not okay to make something up on the fly.

If the questioner disagrees, or wanders too far off-topic, you can always say, “Thank you for sharing these interesting ideas. Let’s talk about this further after the session...”

Resist the temptation to set a questioner straight, particularly if said questioner is ignorant, deluded, or obnoxious. You’ll just look bad. A talk is a forum to share your ideas; it’s not a point-scoring debate.
You could point out features with your hand, but the monitors are often mounted on the wall across the room, or behind you, where you cannot easily reach them without really distracting the audience.

Don’t try to use your laser pointer and then say, “Huh! The laser pointer doesn’t work. Wow! Now what do I do? Well, I guess you can see what I mean…”

USE THE MOUSE TO MOVE THE CURSOR and hope most people can see it.
Sources of good advice:

*The Craft of Scientific Presentations,*
2nd ed., Michael Alley (Springer, 2014)
http://www.craftofscientificpresentations.com/

Any of the Edward Tufte books
http://www.edwardtufte.com/tufte/

Alexei Kaptarev's *Death by PowerPoint*
http://www.slideshare.net/thecroaker/death-by-powerpoint

*Celia’s PowerPoint Tips*
http://physics.illinois.edu/people/Celia/PPT-Tips.pdf
To recap...

Decide on your goals and analyze your audience

Identify one or two main points that you want the audience to take away with them

Design your talk to make these points clearly, concisely, and memorably

Rehearse and revise (shorten!)

Take every opportunity to speak

Finish on time!

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http://physics.illinois.edu/people/Celia/

NOTES: