
How to Give a Scientific Talk



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Why is Giving a Good Talk Important?



- How to assess research performance?
 - Yield, productivity
 - Reputation, recognition
 - Influence, impact
- Performance is not only what you do
 - What you say
 - How you say it
 - Whom you say it to

Avital, M. and Collopy, F. (2001)

<http://www.cs.aau.dk/~luca/SLIDES/howtotalk-ru.pdf>

You need to be seen and heard, to be known and read

Presentations Help with Productivity, Recognition and Impact



- Present your research as often as possible
 - People exposed to your ideas, you become known
 - Vets your research
 - Feedback => honed ideas and presentation, confidence in publication
 - Alerted to potential competitors and any urgency in publication
 - Accrue citations in first year
 - “Invited presentations” => external recognition
 - Speak with leaders in your field, collaborators, peers
 - Builds professional social capital – you’ll be invited to participate in strategic committees
-

Presentation Outline

- Structuring your story
- Preparing your data/information
- Preparing the presentation
- Giving the presentation
- Questions and answers

Resources

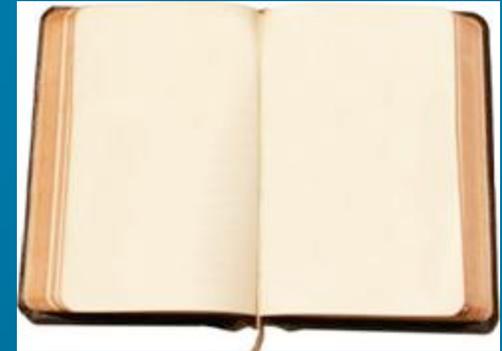
- Luca Aceto, Aalborg University and Olivier Danvy, Århus, Denmark
 - <http://www.cs.aau.dk/~luca/SLIDES/howtotalk-ru.pdf>
- Michigan State University Graduate Student Organization
 - <http://www.fw.msu.edu/orgs/gso/documents/GSOWorkshopDocsSp2006/TipsforGivingaScientificPresentation.pdf>
 - <http://www.fw.msu.edu/orgs/gso/documents/GSOWorkshopDocsSp2006/PresentationTipinPowerPoint.ppt#428,1>
- Susan Herzog, Eastern Connecticut State University
 - <http://www.easternct.edu/smithlibrary/library1/presentations.htm#ppt>
- Heather Heying, Evergreen
 - <http://academic.evergreen.edu/H/heyingh/downloads/givingatalk.pdf>
- Mark Schoeberl and Brian Toon
 - http://www.cgd.ucar.edu/cms/agu/scientific_talk.html
- UJohn Cairns, Jr., *BioScience* Vol. 39 No. 9
 - <http://www.fw.msu.edu/orgs/gso/documents/GSOWorkshopDocsSp2006/CairnsSpeakingAtLength.pdf>
- CD-Condensed Matter Journal Club
 - <http://www.physics.ucdavis.edu/~kliu/Phy298/PresentationTips.pdf>
- Meshnick SR, Eaton JW., City College, CUNY Medical School,
 - Prog Clin Biol Res. 1989;319:663-4. How to give a scientific talk., New York., PMID: 2622932 [PubMed - indexed for MEDLINE]
- How to give a job talk
 - <http://www.psychologicalscience.org/observer/getArticle.cfm?id=2046>
 - <http://chronicle.com/jobs/2001/03/2001033002c.htm>

Structure

- Basic rule
 - Say what you are going to say
 - 1-3 main points in the introduction
 - Say it
 - Give the talk
 - Then say what you said
 - Summarize main points in the conclusion
 - Don't try to build suspense and then unveil a surprise ending



Tell a Story



- Prepare your material so that it tells a story logically
 - Subject: title, authors, acknowledgements
 - Introduction/overview
 - Method/approach
 - Results/information/analysis
 - Conclusion/summary
- Use examples, anecdotes, and significant details
- Create continuity so that your slides flow smoothly
 - Guide the audience through your story
 - Your last point on one slide can anticipate the next slide

Audience



- Why and to whom are you giving this presentation?
 - What do you want the audience to learn?
 - Think about this as you construct your talk
 - Edit your slides -- delete what is unnecessary, distracting, confusing, off point
-



The Embassy of Italy in the United States
 The Embassy of France in the United States
 The Office of Polar Programs of the National Science Foundation
 The French Polar Institute, IPEV
 The Italian National Antarctic Research Programme, PNRA
 The French National Center for Scientific Research, CNRS

are pleased to invite you to

“Science at the poles”

a journey through multidisciplinary sciences

featuring international experts in:

physical sciences
 geosciences
 environmental sciences
 life sciences...

Live communications with
 South Pole base (USA) and Concordia base (France & Italy)

date: Thursday, May 25th 2006, 9:00am-6:15pm

venue: Embassy of Italy in the United States
 3000 Whitehaven Street, NW - Washington, DC 20008

RSVP: 202 944 6220 – 202 612 4437

or by email: phuong.pham@diplomatie.gouv.fr scientifici.washington@esteri.it



Dear Dr. Pfirmán,

On behalf of the Italian and French Embassy, I would like to thank you very much for your participation to the "Science at the Poles" seminar, organized with NSF/OPP on Mai 25th.

Your talk was really impressive and provided an excellent overview of Arctic water and sea ice dynamics. **It made it possible for the attendees to capture the issues at stake regarding the impacts of climate change in boreal regions.**

I hope to have the opportunity to meet you again soon. ...

Thank you again and best regards
 Philippe

--

Prof. Philippe JAMET, PhD
 Attaché for science and technology
 Office of science and technology
 Embassy of France

Presenting Your Methods, Data, and Results

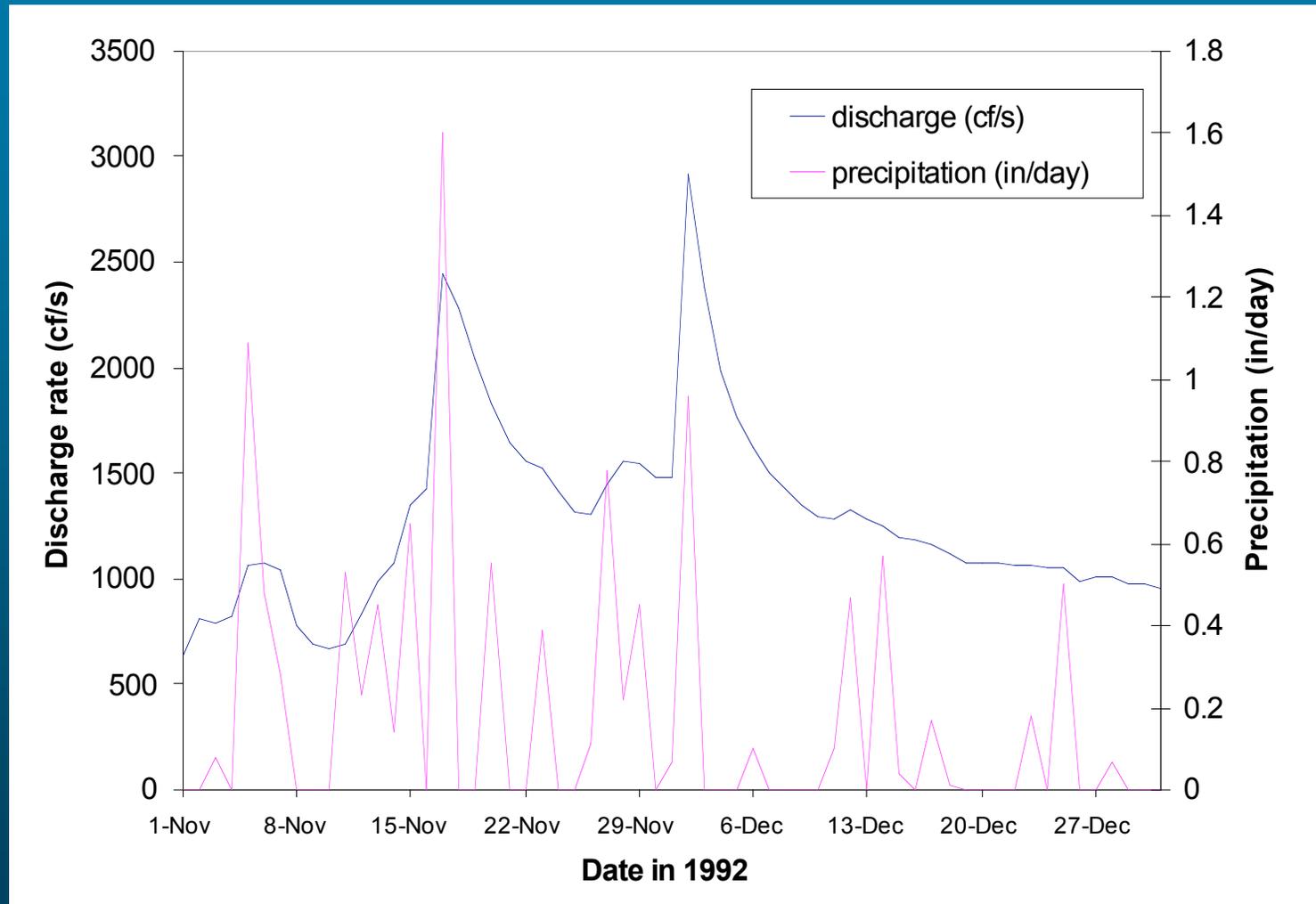
- Methods
 - For most talks, only present the minimum
- Data Tables
 - Tables are useful for a small amount of data
 - Include units
 - Indicate data source if they are not your own
 - But tables are often used badly ...

Esopus Creek

date	discharge (cf/s)	precipitation (in/day)	date	discharge (cf/s)	precipitation (in/day)
1-Nov	631	0	1-Dec	1480	0.07
2-Nov	808	0	2-Dec	2920	0.96
3-Nov	794	0.08	3-Dec	2380	0
4-Nov	826	0	4-Dec	1990	0
5-Nov	1060	1.09	5-Dec	1770	0
6-Nov	1080	0.48	6-Dec	1620	0.1
7-Nov	1040	0.28	7-Dec	1500	0
8-Nov	779	0	8-Dec	1420	0
9-Nov	686	0	9-Dec	1350	0
10-Nov	670	0	10-Dec	1290	0
11-Nov	696	0.53	11-Dec	1280	0.1
12-Nov	831	0.23	12-Dec	1330	0.47
13-Nov	985	0.45	13-Dec	1280	0
14-Nov	1080	0.14	14-Dec	1250	0.57
15-Nov	1350	0.65	15-Dec	1190	0.04
16-Nov	1430	0	16-Dec	1180	0
17-Nov	2440	1.6	17-Dec	1160	0.17
18-Nov	2280	0	18-Dec	1120	0.01
19-Nov	2040	0	19-Dec	1080	0
20-Nov	1830	0.55	20-Dec	1070	0
21-Nov	1650	0	21-Dec	1080	0
22-Nov	1560	0	22-Dec	1060	0
23-Nov	1520	0.39	23-Dec	1060	0.18
24-Nov	1410	0	24-Dec	1050	0
25-Nov	1320	0	25-Dec	1050	0.5
26-Nov	1310	0.11	26-Dec	986	0
27-Nov	1450	0.78	27-Dec	1010	0
28-Nov	1560	0.22	28-Dec	1010	0.07
29-Nov	1550	0.45	29-Dec	977	0
30-Nov	1480	0	30-Dec	972	0
			31-Dec	957	0

Discharge of the Esopus Creek (Coldbrook, NY) and precipitation at Slide Mountain, NY (source: USGS/NCDC)

Esopus Creek



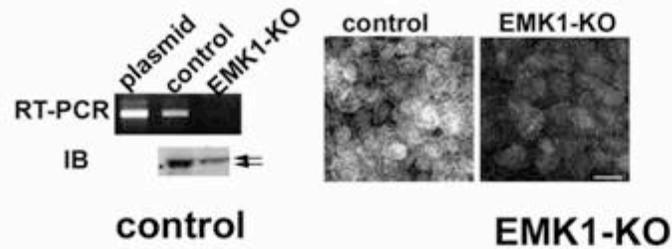
Discharge of the Esopus Creek (Coldbrook, NY) and precipitation at Slide Mountain, NY (source: USGS/NCDC)

Preparing Your Data, continued

■ Figures

- '1 figure \approx 1000 words'
- Figures should be readable, understandable, uncluttered
- Keep figures simple, use color logically for clarification
 - Blue = cold, red = warm, dark = little, bright = a lot
 - Invisible color
 - Meaning attached to colors (color blindness is more common than you think)
- Explain axes and variables
- Include reference on figure

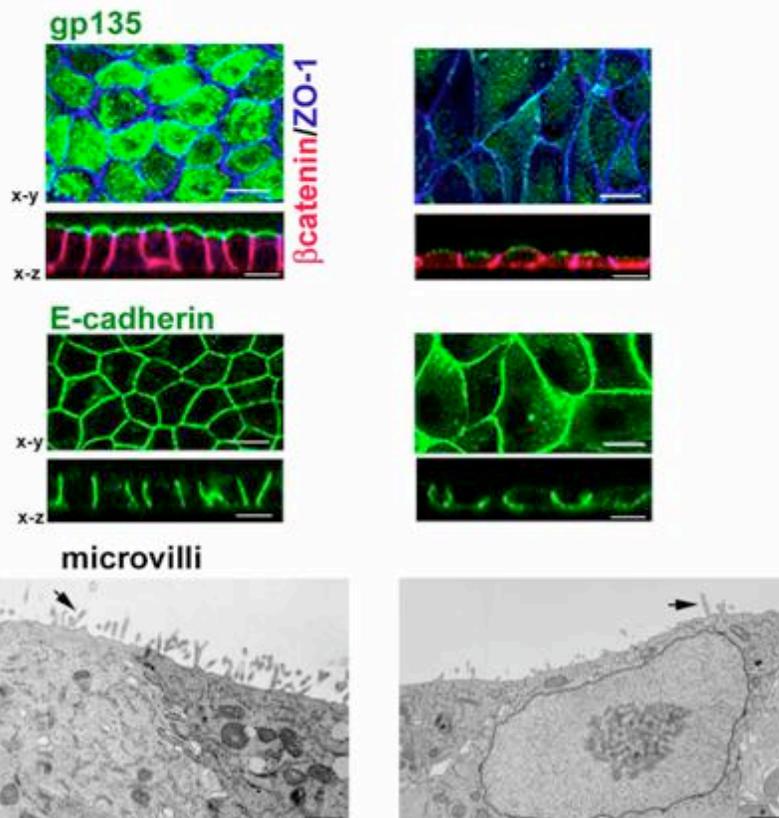
A EMK1-knockdown



B collagen overlay



C Ca-switch



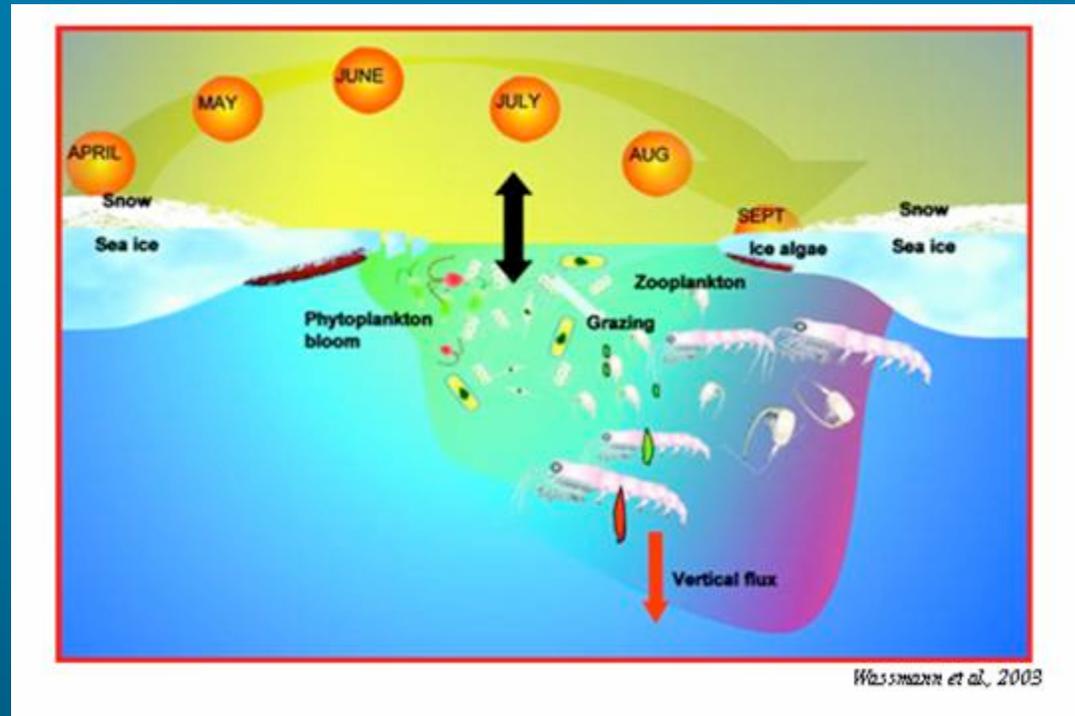
Emk1 knockdown inhibits lumen formation in MDCK cells:

-RT-PCR: EMK1 is effectively knocked down in MDCK cells 24 hours after transfection with P-SUPER (control) or P-SUPER-siEMK1 plasmid; knockdown confirmed on the right with antibodies to EMK1.

- Collagen overlay assay: cells cultured 24 h on collagen I before being overlaid with additional collagen on the apical surface, analyzed 24 h later. Note the lack of lumen in EMK1-KO cultures.

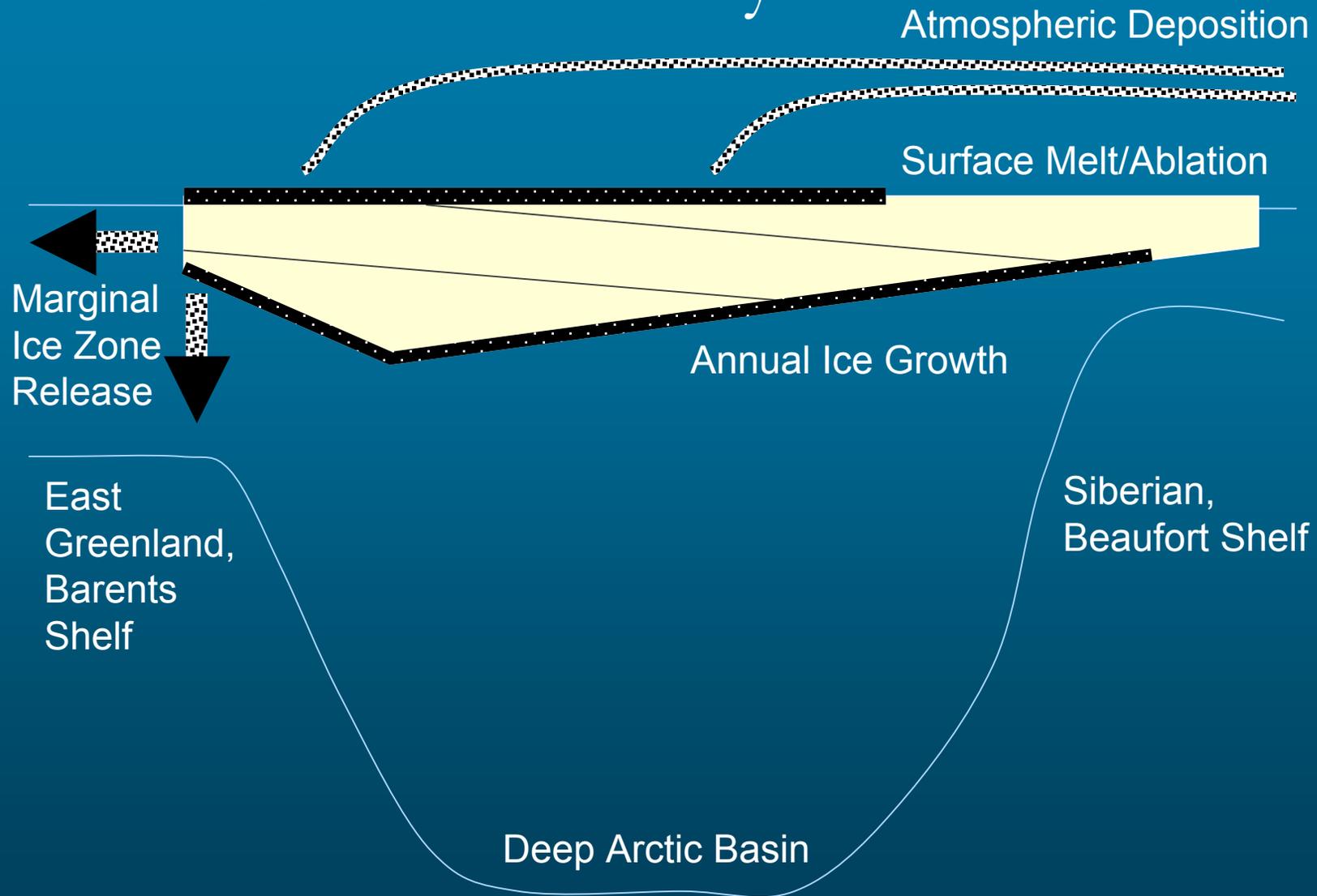
- Ca switch: control or EMK1-KO cells were plated in low Ca medium 24 h upon transfection with pSUPER or pSUPER-KO. After 12 h, cultures were switched to normal medium for 24 h. Transmission EM of cells sectioned perpendicular to the substratum shows lack of microvilli in EMK1-KO cells.

Figures continued ...



- Create a summary cartoon with major findings, or an illustration of the processes or problem
 - Consider showing it at the beginning and the end
- You can use web sources for figures
 - Include reference

Arctic Sea Ice Conveyor



Adapted from Pfirman et al., 1990

Preparing the Presentation

- Average not more than 1 slide per minute
- MS Powerpoint is now standard
 - If you use something else, be careful to check it in advance
- No sounds! Some logical animations good
- Use 3-7 bullets per page
 - Avoid writing out, and especially reading, long and complete sentences on slides
- Slide appearance (font, colors) should be consistent
- Speelcheck

What Font to Use

Type size should be 18 points or larger:

18 point

20 point

24 point

28 point

36 point

**AVOID USING ALL CAPITAL LETTERS
BECAUSE IT'S MUCH HARDER TO READ**

* References can be in 12-14 point font

<http://www.fw.msu.edu/orgs/gso/documents/GSOWorkshopDocsSp2006/PresentationTipsinPowerPoint.ppt#307,6,Powerpoint basics: 1. What font to use>

Color

Dark letters against a light background work

Dark letters against a light background
are best for smaller rooms, especially when the
lights are on for teaching

Color

Light letters against a dark background
also work

Many experts feel that a dark blue or
black background works best for talks in a
large room

Preparing Yourself...



- Immerse yourself in what you are going to say
 - Web of Science/Google it: use the latest news
- Make sure you are familiar with the projection equipment, remote control and Powerpoint
 - Bring your presentation on a memory stick AND a laptop with power supply AND an extension cord ...
- Dress up – maybe wear a jacket?
 - More formal attire makes you appear more authoritative and you show you care enough to look nice

Print Your Slides

- Don't read the presentation
- Print out copies of your slides ('handouts')
 - You can annotate them and use them as notes
 - You can review them as you're waiting
 - If everything crashes – the bulb blows, you can still make your main points in a logical way



www.com.msu.edu/.../powerpoint/printing.htm

Rehearsing



- **Practice – actually stand up and say the words out loud**
 - You discover what you don't understand
 - You develop a natural flow
 - You come up better with phrasings and ways to describe things
 - It is harder to explain things than you think, practicing helps you find the words
 - Stay within the time limit
 - Try speaking too loud to get a feeling where the upper limit is
- **Don't over rehearse or memorize the talk**
 - The first practice things will improve at least 10 fold -- the second will make things twice as good -- the third may add a bit of polish, but from there it can easily get worse

Giving the Presentation

- Starting out is the hardest part of the talk
 - To get going, memorize the first few lines
 - *“Hello, I’m Stephanie Pfirmman. The title of my presentation is, ‘The Arctic Marginal Ice Zone.’ The edge of the pack ice is the most dynamic, the most productive, and – unfortunately -- the most vulnerable region in the Arctic.”*



<http://soroptimistofgreaterdavis.org/documents/images/photos/speaker.gif>

<http://www.fw.msu.edu/orgs/gso/documents/GSOWorkshopDocsSp2006/TipsforGivingaScientificPresentation.pdf>

Giving the Presentation



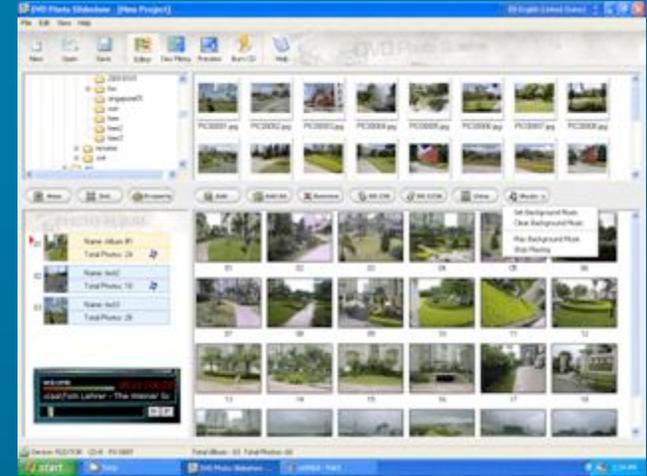
Experienced speakers:

- Speak freely and look directly at audience

Inexperienced speakers:

- Put outline and key points of your presentation on your slides
- This procedure helps:
 - Comfort: you don't have to remember what to say
 - Eyes are on the slide not on you
 - Key points are there for people who weren't listening or who are visual learners

Giving the Presentation



- Stand where the figures can be seen
- Look at people during presentation
- Be enthusiastic
- Don't worry about stopping to think
- Don't rush
 - Figure out which slide is your half-way mark and use that to check your time

Giving the Presentation

- Don't apologize or make comments about yourself
- Don't overuse the pointer
- Don't try to be cute and don't force being funny
- Don't forget acknowledgements, always give proper credit
 - Tip: Everyone in the audience has come to listen to your lecture with the secret hope of hearing their work mentioned

Ending Your Presentation



- Think carefully about how to finish your presentation strongly
 - Don't just drift off ... “I guess that's all I have to say ...”
 - You may want to actually memorize your ending lines, just as you do your starting points
- Ending your talk
 - Say “Thank You” ... pause for applause ... then
 - Say: “Any questions?”

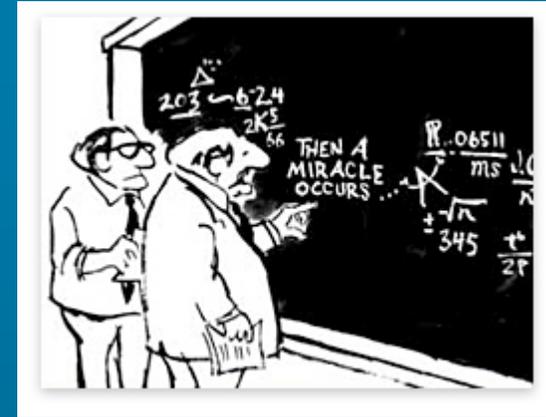
What Can Go Wrong?



www.rcpsych.ac.uk/.../anxiety/images/grap6.jpg

- Uncertainty about material
- Interruptions
- Running out of slides
- Running out of time

Uncertainty About the Material



- Try to structure your talk so that you are sure about the material you present
- If you have to address something important that you are unsure of
 - Acknowledge the gap in your understanding
 - “I’m working on it” or “I’m looking into it”
 - This is better than being pressed to admit something
 - Also it may very well be an open question
- Another way to handle this is to raise it as a question yourself

What Will Happen to Polar Cod, Seals and Polar Bears?



Okosystem Barentshavet. Norwegian Research Program for Marine Arctic Ecology, 1992



Nicklin, Flip. "Beneath Arctic Ice". *National Geographic*. 180(1), July 1991



Stirling, Ian. Polar Bears. Ann Arbor: University of Michigan Press, 1988.

Minor Interruptions During Your Presentation



- Don't look irritated or rushed
- Answer – briefly – just enough to straighten it out
 - Then carry on with your presentation without checking back
- A question that you will answer later in your talk?
 - Say “Good point; just wait two slides”
- Requires a long answer and is not critical understanding?
 - Say “Good point; I'll come back to it at the end of the talk.”

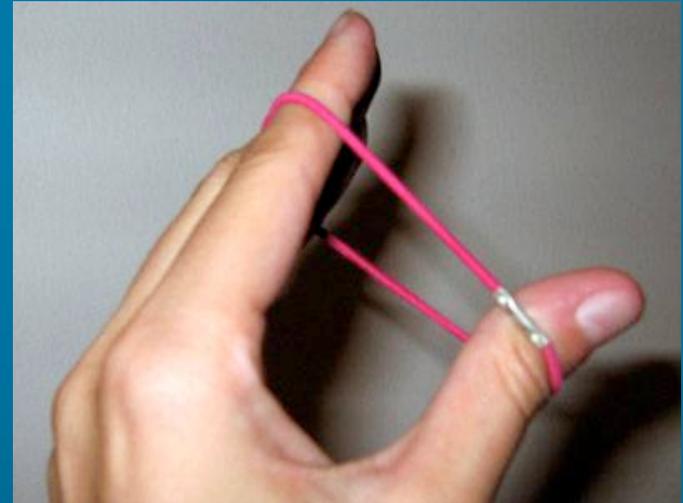
Major Interruptions During Your Presentation



http://www.alumni.berkeley.edu/imgs/Alumni/Mentorship/hand_raised.jpg

- If most in the audience are non-specialists
 - Explain the issue to the audience
 - Delay discussion until after the talk
- If most of the audience is knowledgeable
 - Make your point as clearly as you can
 - Discuss it out – don't try to diminish or avoid it

Running Out of Slides



<http://photolog.icyshard.com/archives/26things3/stretch.jpg>

- Short talks are better than ones that are too long
- What to do:
 - Don't make a personal comment
 - “hum, I'm running out of slides ...”
 - Stretch it a little -- see if you can think of an example, or story, to bolster your points
 - Conclude unhurriedly, summarizing your main points, but don't be repetitious

<http://www.cs.aau.dk/~luca/SLIDES/howtotalk-ru.pdf>

Running Out of Time

“He cannot speak well that cannot hold his tongue”

Thomas Fuller, 1732, *Gnomologia*

- Avoid this – impolite to other speakers and the audience: if it happens ...
 - Do not assume that you can carry on past your time
 - Do not skip all of your slides looking for the right one to put on next
 - Conclude – on time wherever you are in your talk -- by making your main points
 - In Powerpoint you can just type the number of your concluding slide and press Enter to skip right to it

Questions and Answers



- Questions after your talk can be scary but they definitely help you in writing up your research
 - Tell you what part the audience did not understand
 - Can help you focus and add dimension to your research
- You can repeat the question
 - This gives you time to think
 - The rest of the audience may not have heard the question
 - Also if you heard the question incorrectly, it presents an opportunity for clarification

Questions and Answers, continued

- Keep your answers short and to the point
- Don't say that a question is bad, or that you addressed it already
 - Rephrase it into something that you want to talk about
- Never demean the question or questioner
 - They may have friends in the audience, and you never need more enemies
 - The research world is small and you will continue to encounter people throughout your career

Difficult Questions



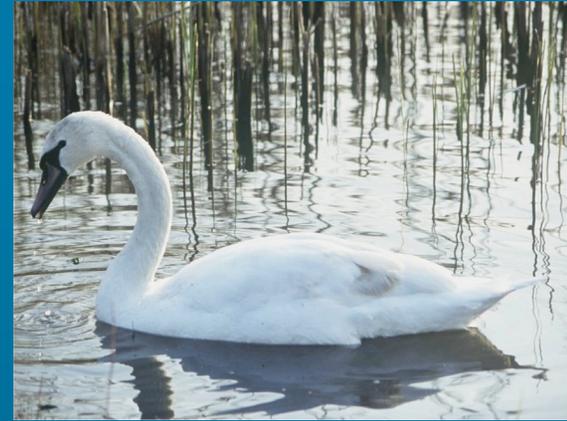
<http://www.regislasvegas.org/images/class-pic-hand-raised.jpg>

- Concerned about questions?
 - Prepare for difficult questions -- extra slides?
 - Usually you have thought more about the material than anyone else -- this puts you in a stronger position than you may think
 - Anticipate typical questions and prepare for them
 - Generalizability of your findings to other times? Other places? Other conditions?
 - Methodological bias? Uncertainties? Exceptions? Priorities?
-

Difficult Questions, continued

- If you really don't know the answer
 - Say "Interesting, I will look into that" or "That's a good point, let's discuss it afterwards"
 - Don't feel that you have to invent an answer on the fly -- you are only human and you can't have thought of everything
- If the questioner disagrees with you and it looks like there will be an argument then defuse the situation
 - "We clearly don't agree on this point, let's go on to other questions and you and I can talk about this later"

Conclusions



- Announce the ending so that people are prepared
 - For example, with a slide titled “Conclusions”
 - Or by saying, “In my final slide ...” or “My final point is ...”
- Have only a few concluding statements
- Summarize the significance of your work
 - Extend it beyond your limited study – but don’t overreach
- Open up new perspective
 - Describe future work, raise questions, potential implications