

SECRETS to a TERRIFIC TECHNICAL TALK

THINGS *ANYBODY* CAN DO

Betty Lise Anderson



THE OHIO STATE UNIVERSITY

MOTIVATION

- I've been to a lot of conferences...

ORGANIZATION (of this talk)

- Planning
- Preparing
- Presenting
- VISUAL AIDS!!!
- Handling Questions
- Conclusions

A TALK IS *NOT* A PAPER

- Cannot cover everything
- Cannot go into the same detail
- Make hard decisions about content
- Time required is roughly the same
 - » For a paper, time is in the writing and editing
 - » For a talk, time is in the planning and practicing!

HEARING vs. READING

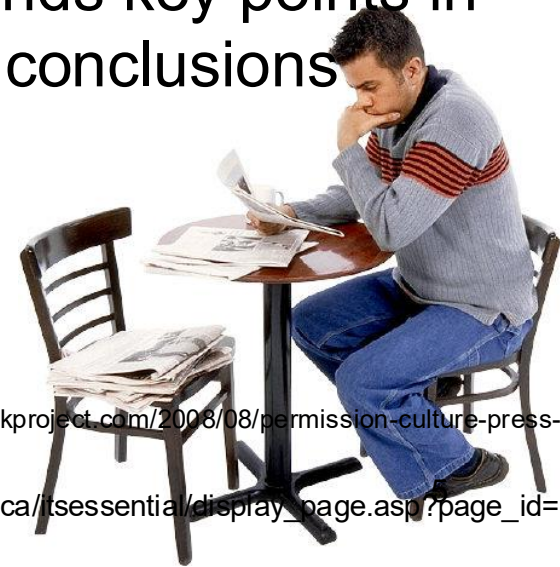
HEARING

- Linear
- Hear everything once
- Depend on speaker to make organization clear
- Speaker must repeat key points



READING

- Skip around
- Can reread hard parts
- Depend on headings to make organization clear
- Reader finds key points in abstract, conclusions



<http://audience.workbookproject.com/2008/08/permission-culture-press-escape/>

http://www.itsessential.ca/itsessential/display_page.asp?page_id=32&print=1

Hearing vs. Reading cont.

HEARING

- » Once lost, listener cannot recover
- » Pace set by speaker
- » People may zone if you're dull or confusing, but they'll try to recover at your Conclusions



READING

- » If lost, go back and reread hard parts (or pitch article)
- » Pace set by reader
- » Some people skim, or read only abstract, or conclusions, or only look at the pictures...

Speaker controls the flow of information

- Not like a paper, where reader controls it
- Therefore, **ORGANIZATION** and **PLANNING** are key



Don't ask "What am I going to talk about?"

ASK *WHY?*

- Inform or instruct (e.g., at a conference)
- Persuade or sell (dissertation defense)
- Arouse interest (hire me!)
- Inspire or initiate action (fund me!)
- Evaluate, interpret, clarify
- Gather ideas/lead discussion
- Entertain



EVALUATE YOUR AUDIENCE

- Technical?
Students? Lay people?
- More informed or less informed than you?
- Why are they there?
What do they want?



Where? When?



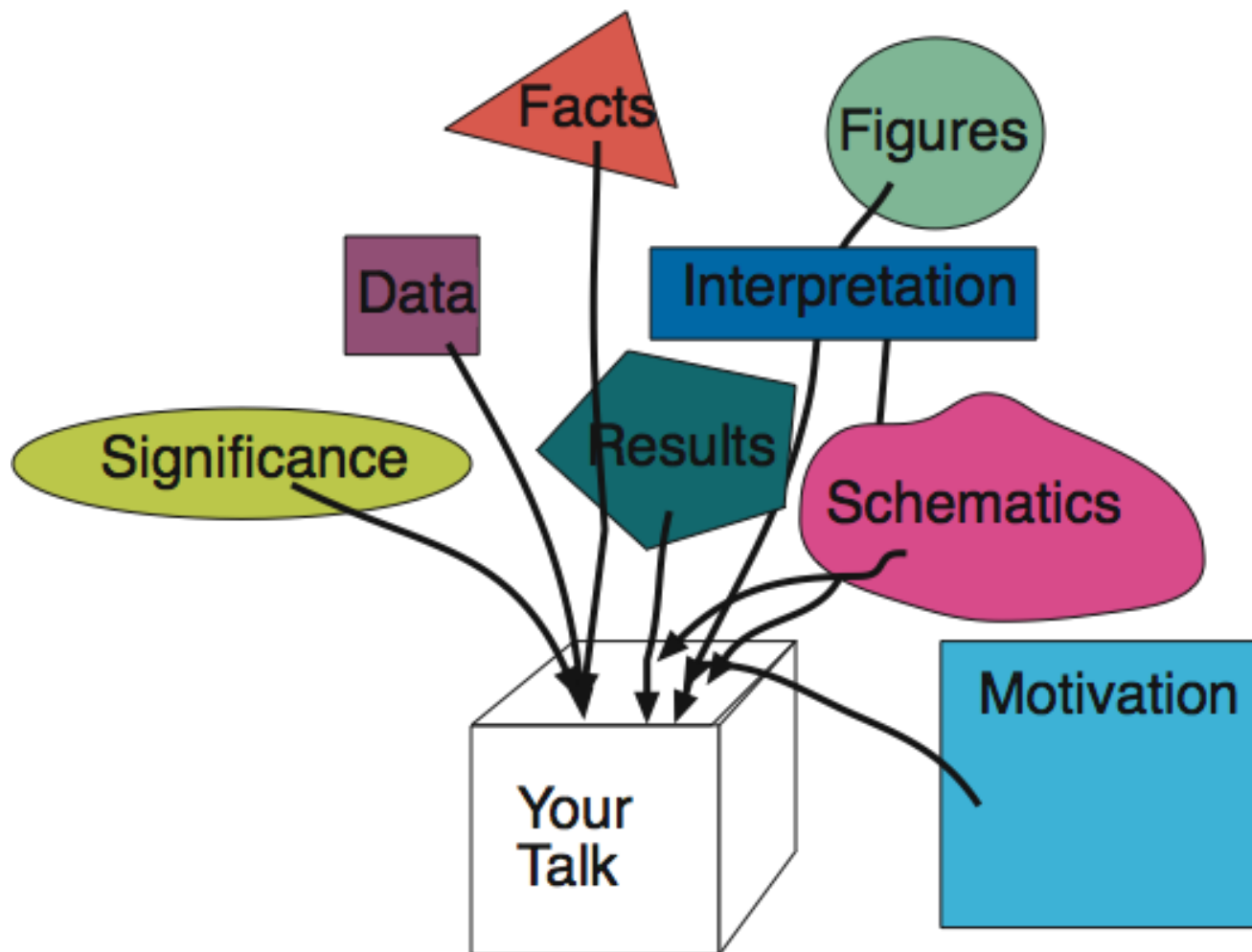
- What kind of a room? Big, small, loud, hot, dark, hard to find...
- Audio visual equipment? What do you need, and what is your backup?
- Stage? Microphone? Should you bring a pointer?
- Early in day? End of day? *Right after lunch???*

Check it out in advance

- Make sure projector works **HAHAHA**
and has a spare bulb
- Learn how to use
microphone
- If using a computer, make
sure it works
 - » ... and have a backup!
- Decide where you'll stand,
what kind of pointer you'll
use, where you'll set your
stuff



Now, gather information



IT
WON'T
ALL
FIT!

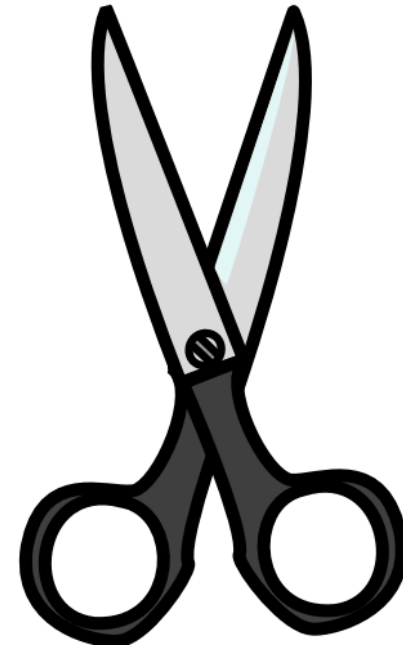
How should you organize?

- According to the material
 - » In order of discovery?
 - » In order of cost?
 - » In order of difficulty?
- According to the audience
 - » Start with simple case
 - » Build up complexity
 - » Relate materials to what they already know

COMBINATION

WRITE AN OUTLINE

- Is everything in it necessary? Is everything in it important?
- Will the audience understand each idea, or does it need a background slide to explain it?
- Will anything you've included raise questions you're not prepared to answer?
- Have you made and repeated your key points?
- Will it fit into the time allowed?



EVERY TALK SHOULD HAVE

- Title slide
- Organization slide
- Good stuff in the middle
- Conclusions slide

Title slide

- Should contain:
 - » Title of talk
 - » Authors and co-authors
 - » Organization
 - » Sponsors
- When presenting:
 - » Read or paraphrase the title
 - » Pronounce everybody's name
 - » Say who you are
 - » Thank sponsor (if applicable)

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Next make an organization slide

- Organization of your talk
- Helps audience figure out what your scope is
 - » Theoretical?
 - » Experimental?
 - » Speculative?
- Give you a chance to say your key point for first time

ORGANIZATION

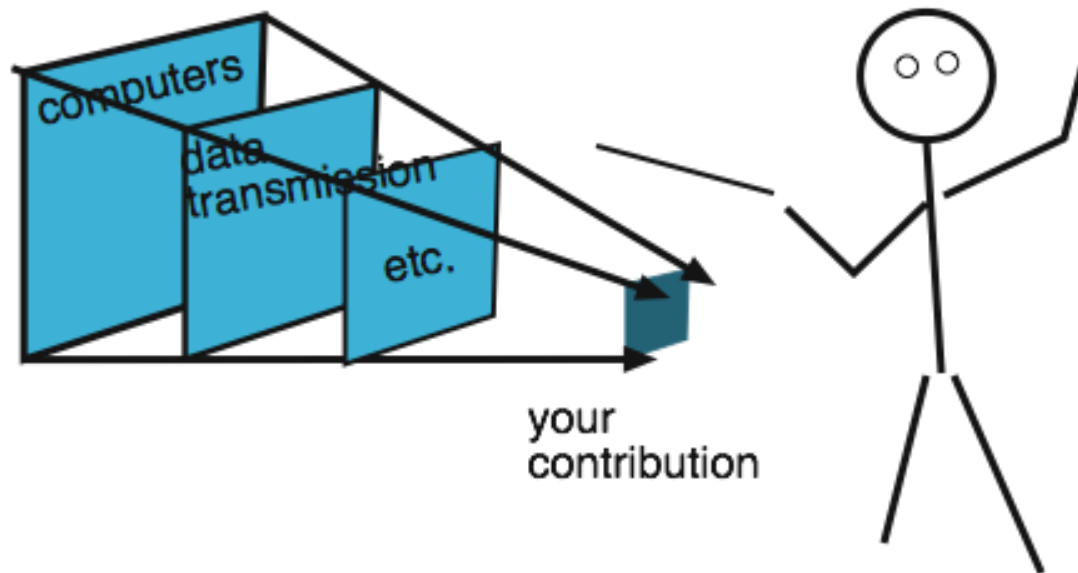
- Why use lasers in fiber optics?
- Review of LED' s, lasers, and light bulbs
- Theory showing lasers are brighter
- Experimental data
- Conclusions

My key point



ALWAYS Start with big picture

- Explain the problem you're trying to solve
- Explain how it fits into big scheme of things
- Approach you took and why



Are they lost yet?

- ❑ Remember: if you jump right into your results without the big picture, you've lost your audience
- ❑ Once you've lost them, you won't get them back until your final slide.
- ❑ If then.



Repeat your key points

- Tell ‘em what you’re going to tell ‘em, tell ‘em, then tell ‘em what you told ‘em.
- State key points at beginning and end and any chance you get in the middle
- Use short, internal summaries:
 - » “I’ve just shown that the equations predict a laser is brighter than a light bulb; now I will present the experimental data ...”

Make your visuals

More on this later...

PRACTICE YOUR TALK



- Do it out loud.
- With the visuals.
- Time it.

- Decide what to cut out.

Practice it again.

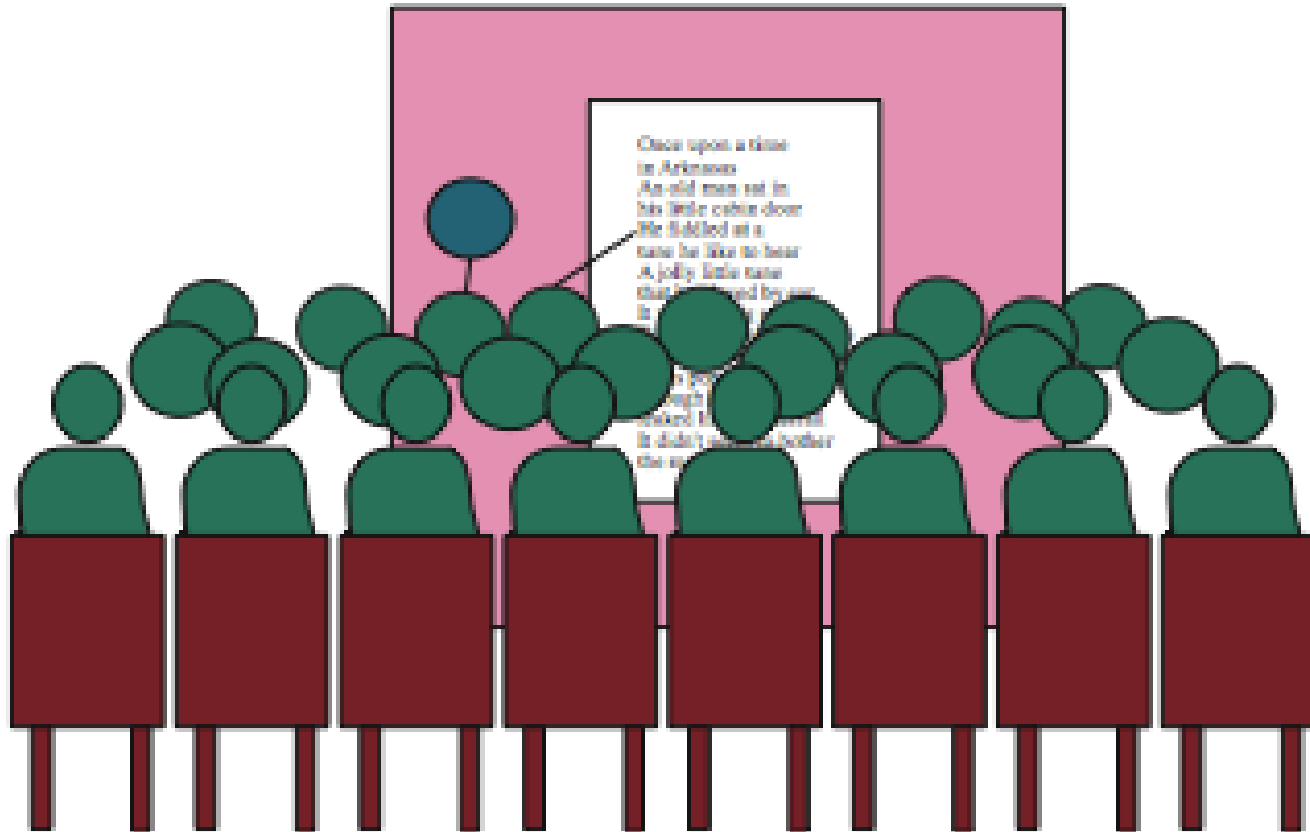
- And again.
- Wait a day or two.
- Practice it again.
- Practice it again the night before you give it.
- Time it every time.



The worst mistakes (and most common)

- No big picture.
- Crappy slides.
- Too long.
- Didn't practice.
- Can't follow.
- Didn't reiterate key points

VISUAL AIDS

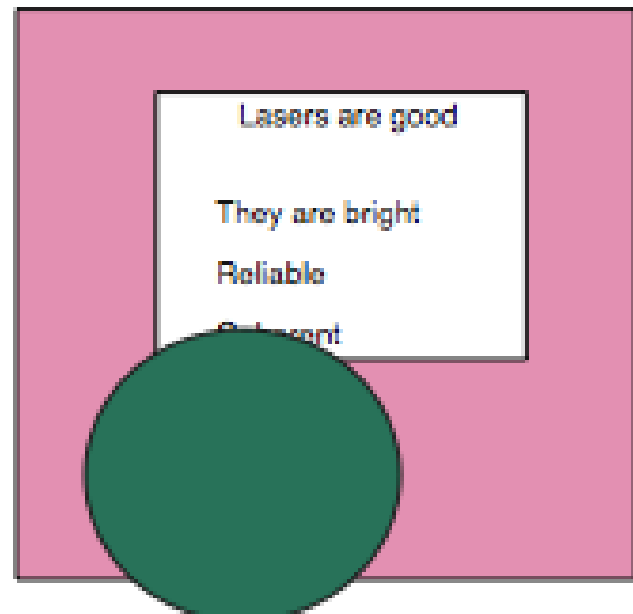
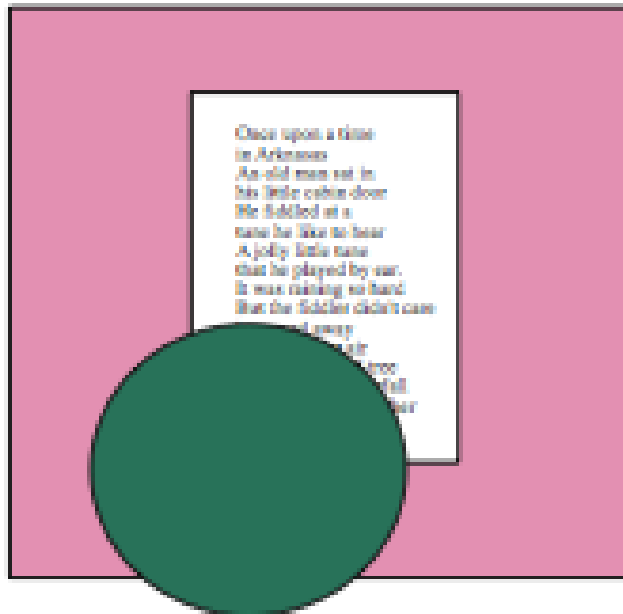


This is the problem.

SOLUTIONS:

- USE LARGE TYPE
- LIMIT THE AMOUNT OF INFORMATION PER SLIDE
 - » Keep key points away from bottom
- STATE YOUR POINT
- KISS (keep it simple, stupid!)

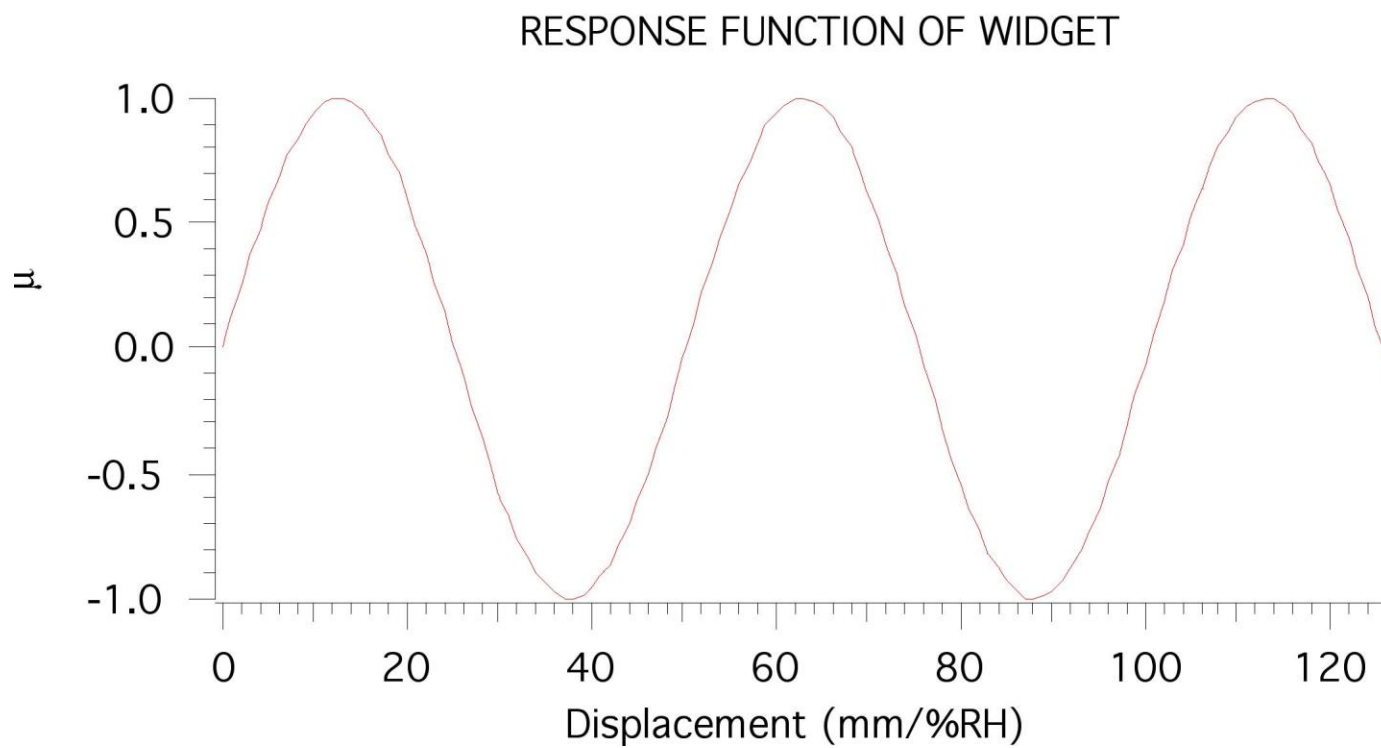
Compare:



Simplifying slides

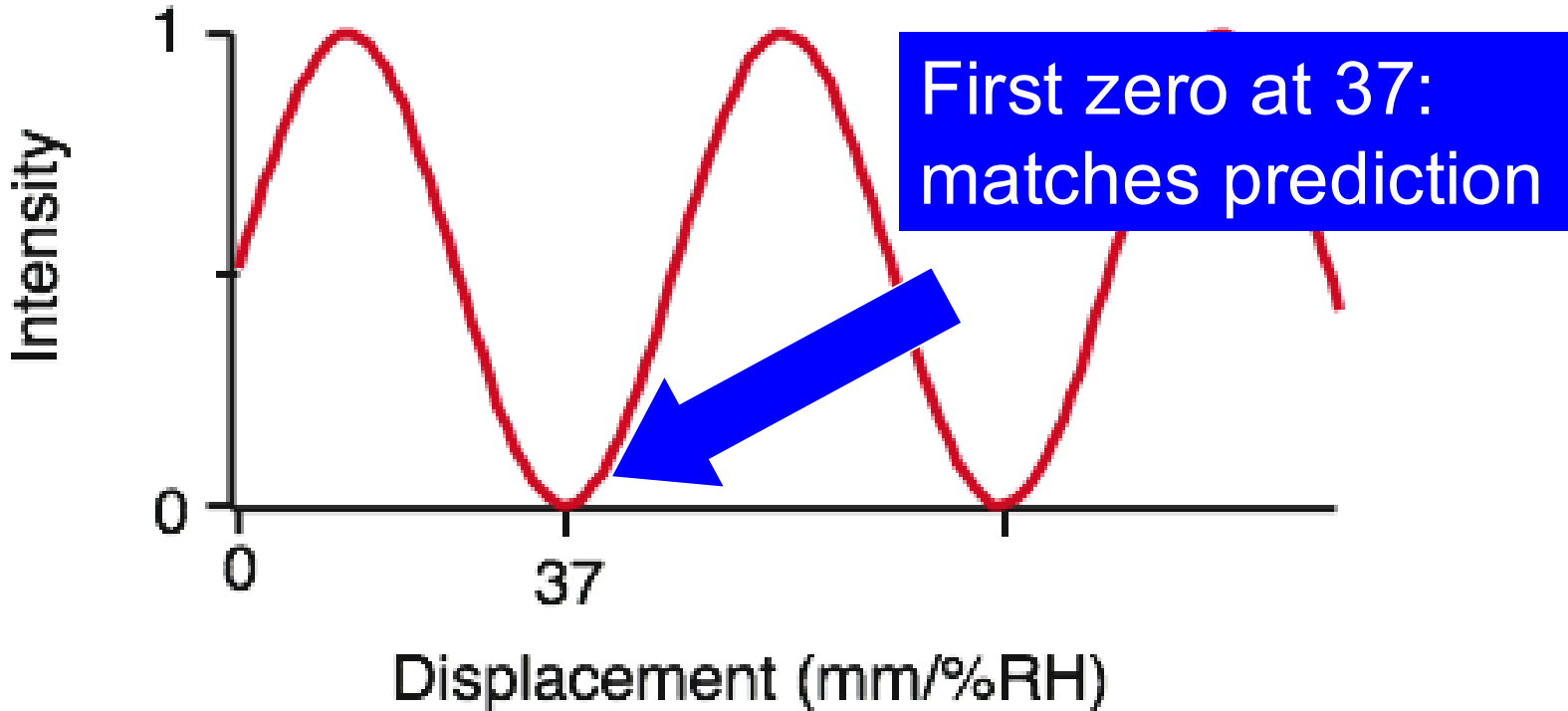
- Get rid of anything you won't talk about
- Makes lines fat, type bold
- Make sure the point you want to make is on the slide
 - » What is the one thing (one idea) you want your audience to get?
 - » If you don't know what the point is, you don't need the slide

Bad

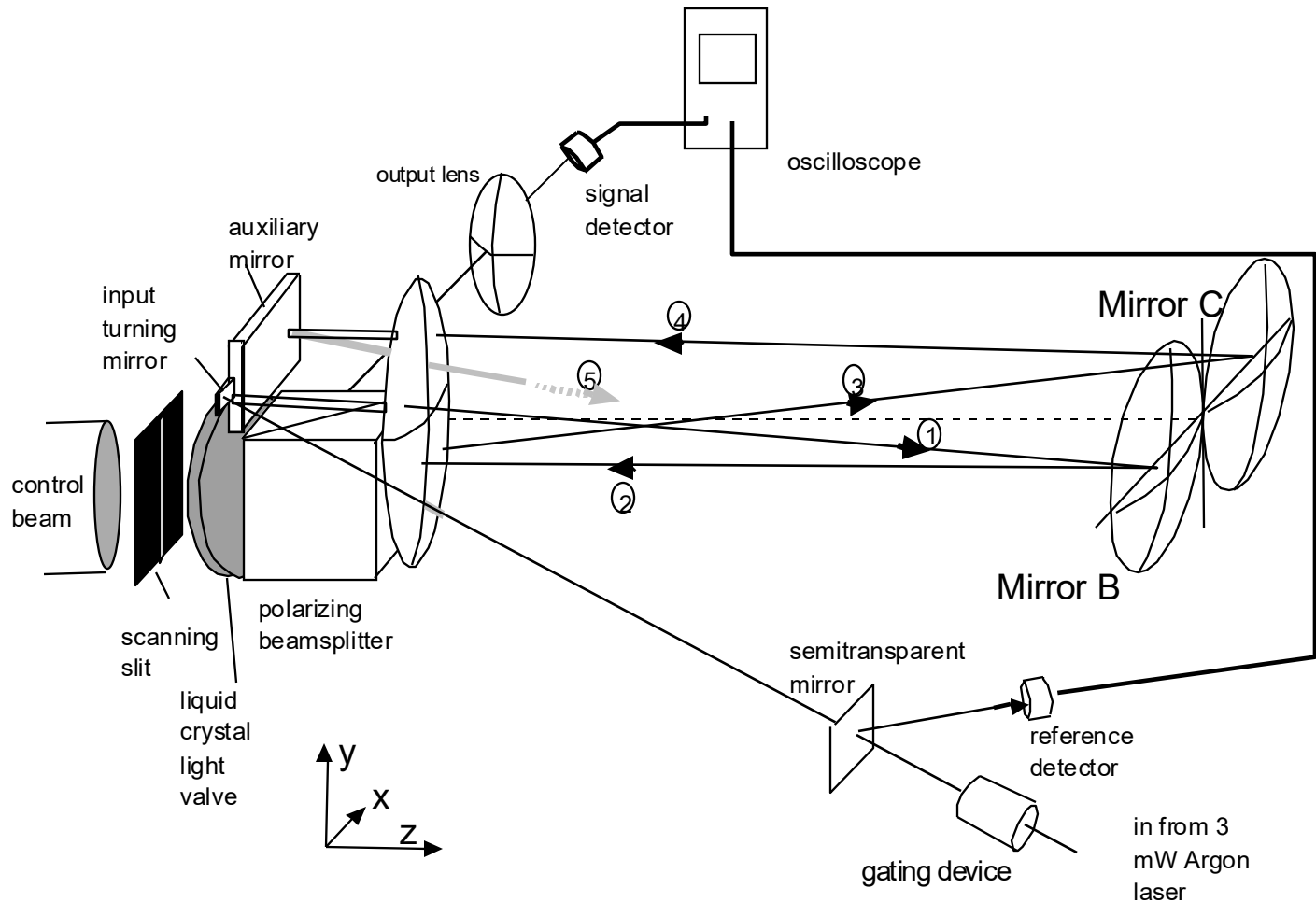


Better

WIDGET RESPONSE



OK for a paper...



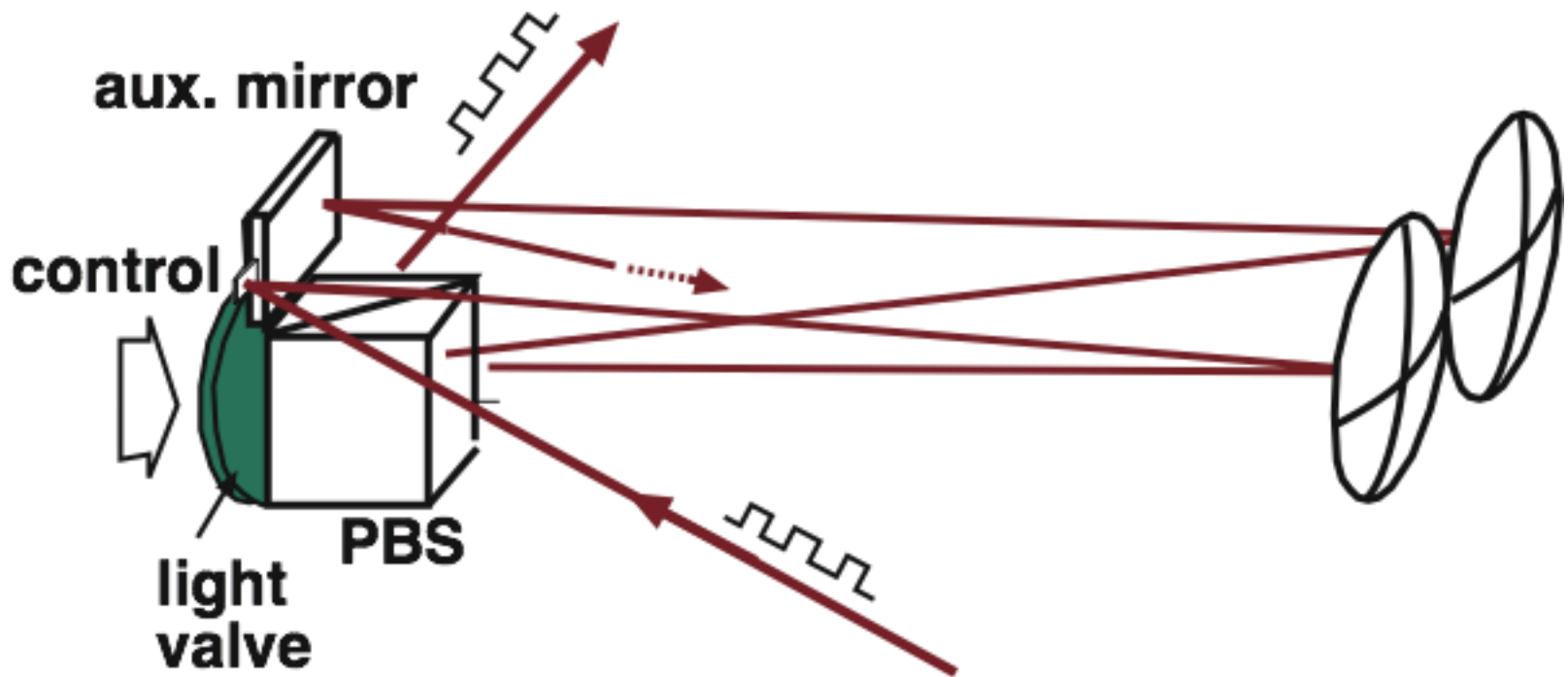
But...

- Can study a paper, can view slide only for short time
- Too many details: viewer stops listening while trying to figure out figure
- Viewer panics because can't comprehend figure before you take it down

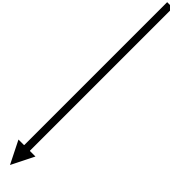
To fix:

- Remove all ancillary stuff
 - » Remove power supplies, non-critical components, labels, arrows if possible
 - » Strip figure down to bare bones
- Make lines bold!
- Simplify, simplify, simplify.
- Use color to make things stand out or group like objects

Better for a talk.



BAD



The Advantages of Fiber Optics:

1. They are cheaper than wire for most installations
 2. Fiber optics are more durable and last longer than copper wire since they are not susceptible to corrosion.
 3. Fibers are difficult to tap.
 4. Fibers are insensitive to electromagnetic interference (EMI) such as lightning or machine noise.
 5. Fiber optics have higher bandwidth than copper wire, so more information can be transmitted per second.
 6. Fibers are less sensitive to nuclear radiation.
- Fiber systems are expandable once installed by using wavelength-division multiplexing on existing fibers.

Disadvantages:

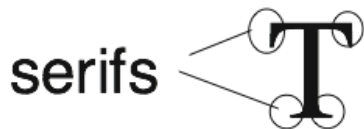
1. Fibers are sharp and could put your eye out.
2. Fibers are not cost-competitive in some applications. For example, it is not usually worthwhile to lay fiber to the home while it *is* cost effective to lay fiber in the loop.
3. Fibers are difficult to splice because of alignment problems and the need to have good cleaves on both surfaces. They can't be soldered like wire.
4. Fibers make ridiculous wigs and tacky lamps.

- Too many ideas
- Too small
 - » (that was 12-point, standard for typing)
- Serif font
 - » (great for reading on a page, bad for slides)
- Long sentences
- Audience stops listening because they're trying to read this

Serif and non-serif fonts

- Serifs help carry the eye along lines of text-great for pages of text
- Non-serif fonts better for single words, phrases
- Notice billboards always use non-serif fonts.

The Ohio State University



The Ohio State University

□ Serif fonts:

» Times

» Palatino

» Courier

□ Non-serif fonts:

» Helvetica

» Arial

To fix busy slide

The Advantages of Fiber Optics:

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4. Fibers make ridiculous wigs and tacky lamps.

- Break up into more than one slide
- Use big fonts
- Use non-serif font like this one
- Capture each thought in a phrase

Advantages of Fiber

- Cheaper
- Durable
- Can't tap
- No EMI
- High bandwidth
- Radiation-hard
- Expandability (e.g., WDM)

Disadvantages of fiber

- Sharp (potential eye damage)
- Not always cost-effective
- Difficult to splice
- Image problems

Use white space

TITLE OF MY SLIDE

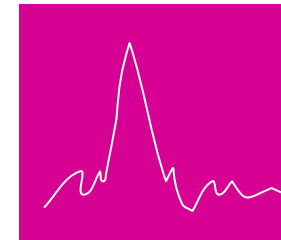
Once upon a time in Arkansas, an old man
Sat in his little cabin door, he fiddled at a tune
He liked to hear, a jolly little tune that he
played by ear



$$|d| = \begin{bmatrix} 3 & 7.54 & 19 \\ \pi & \omega & 12 \\ -17 & 6 & x \end{bmatrix}$$

TITLE OF MY SLIDE

One idea
per slide



Suppose they have to see more than one thing at once

- Will help to see this graph while discussing equation

$$|d| = \begin{bmatrix} 3 & 7.54 & 19 \\ \pi & \omega & 12 \\ -17 & 6 & x \end{bmatrix}$$



Then show them one first

- Here are my main points about the graph
- Audience gets familiar with it while I'm talking
- Then show it again, adding the equation



Now they don't need to see it in as much detail

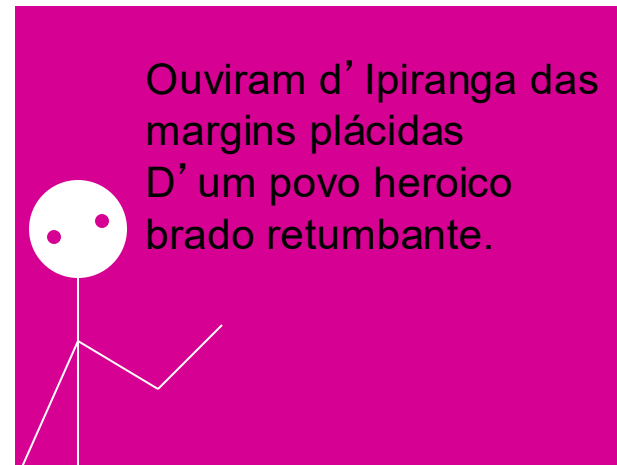
- Graph is there, but smaller- they can refer to it
- Equation is now main point, and they can see it well



$$|d| = \begin{bmatrix} 3 & 7.54 & 19 \\ \pi & \omega & 12 \\ -17 & 6 & x \end{bmatrix}$$

If you are difficult to understand...

- Speech impediment?
- Not giving talk in your native language?
- Then, by all means, put more words on your slides
- Key is to be understood



Try to put some kind of picture on every slide



- Adds visual interest
- Breaks up monotony
- But, be careful not to overdo it
- Don't make it distracting

Beautiful landscape- but what does it have to do with anything?

Example: a parts list



- 1 Piece styrofoam, 2" square
- 2 Jumbo paper clips
- 1 D-cell battery
- 2 rubber bands
- 2 lengths hook-up wire, ends stripped
- 1 ceramic magnet, 1" x 2"
- 1 coil of 24 gauge magnet wire

Better way

Paper clips

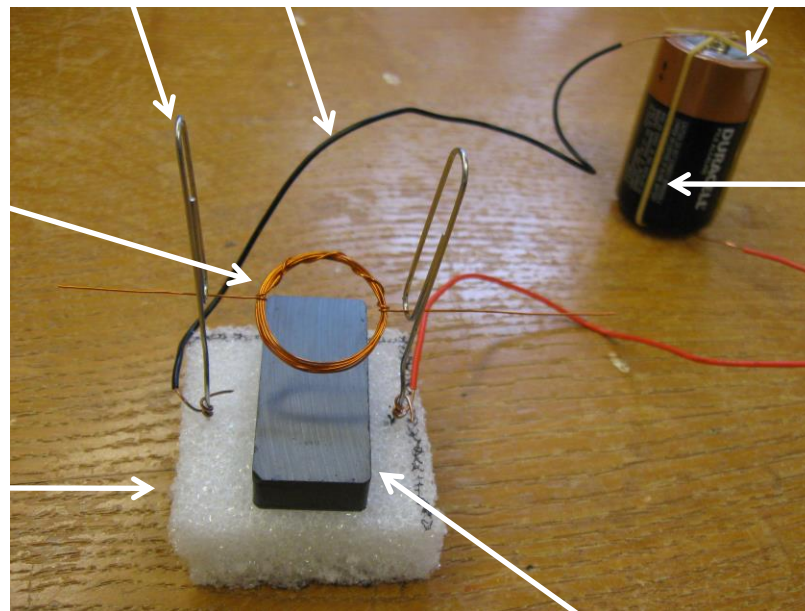
Wire

D-cell battery

Coil (24 gauge,
8 turns)

Rubber bands

Styrofoam



Ceramic magnet

Example

$$\mu_{12} = \gamma_{12}(0) = \frac{e^{ik\left(\frac{x^2+y^2}{2z}\right)} \frac{1}{z^2} \iint_S J(v_x, v_y) e^{-ik(v_x x + v_y y)} dv_x dv_y}{\frac{1}{z^2} \iint_S J(v_x, v_y) dv_x dv_y}$$

- Screw the phase constant (not important)
- Don't define two things at once
- Who cares about normalization constant?
- What is the IDEA behind this?

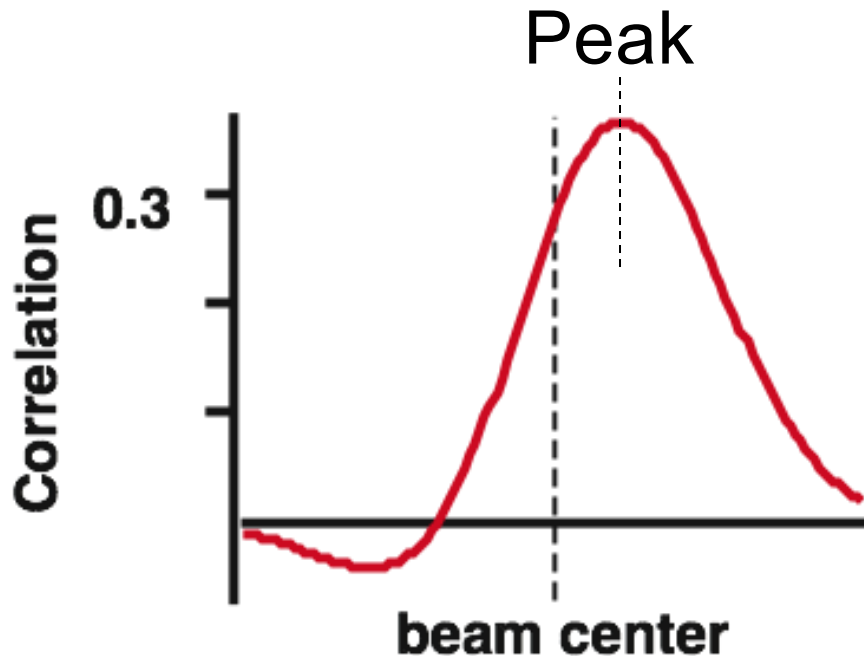
Better way:

Input intensity

$$\mu \propto \underbrace{\int_S J(v_x, v_y) e^{-ik(v_x x + v_y y)} dv_x dv_y}_{\text{Fourier transform}}$$

Fourier transform

Presenting plots



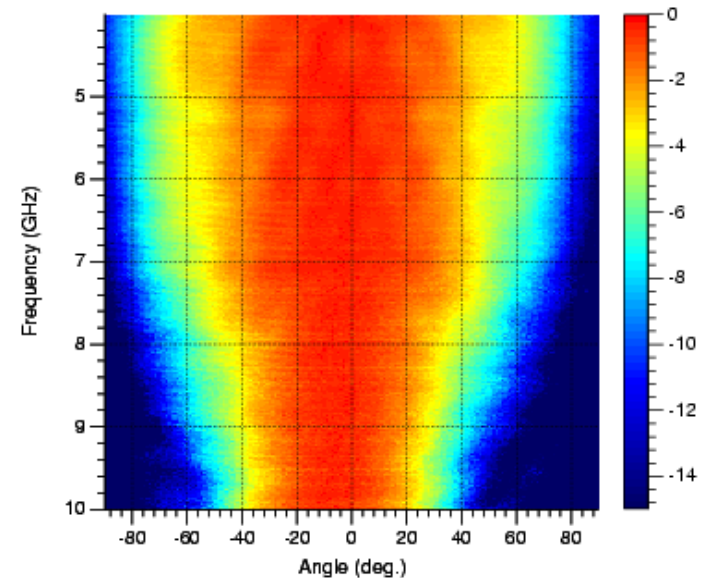
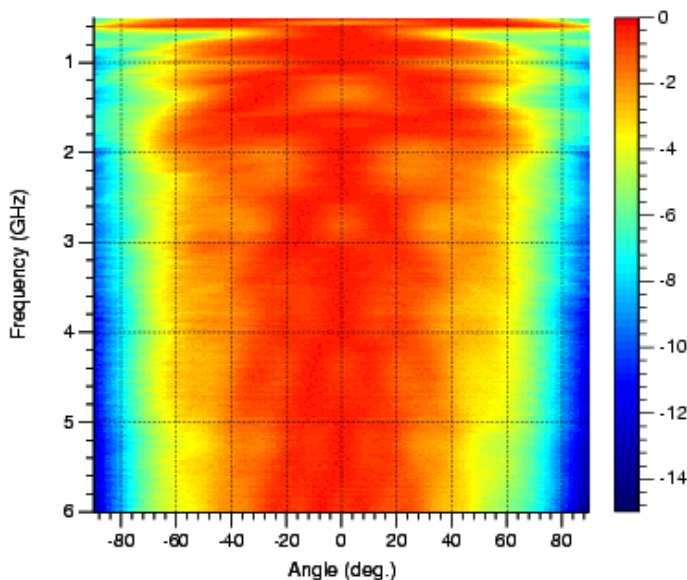
- Keep them simple
- Read the axes out loud
- Tell audience what you're looking for
- Point it out to them
- Tell them whether it's good or bad



Normalized SEP – E-plane Scans

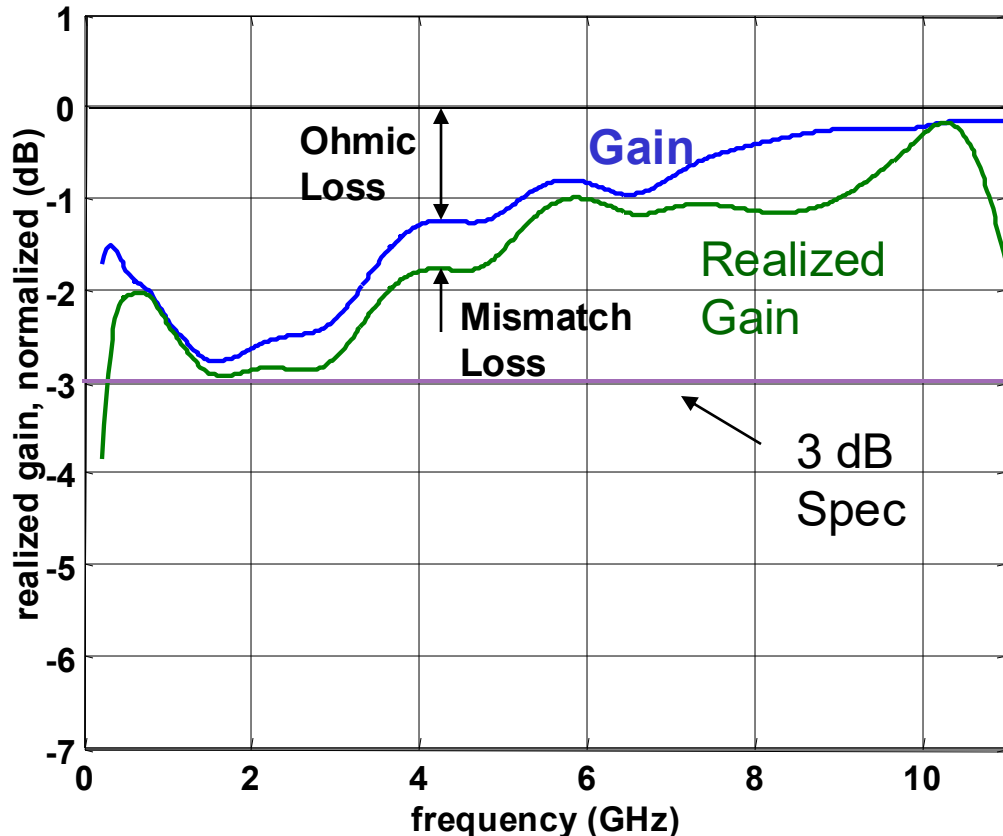


- Normalized so max value across any frequency cut is zero
- Beamwidth of SEP shows scan volume vs. frequency
- Angle scans in azimuth



No evidence of scan blindness!

Periodic Array - Design Prediction



Design Incorporates:

- » One driven and two parasitic Face Sheet layers
- » Multi-layer r-card screen

Performance:

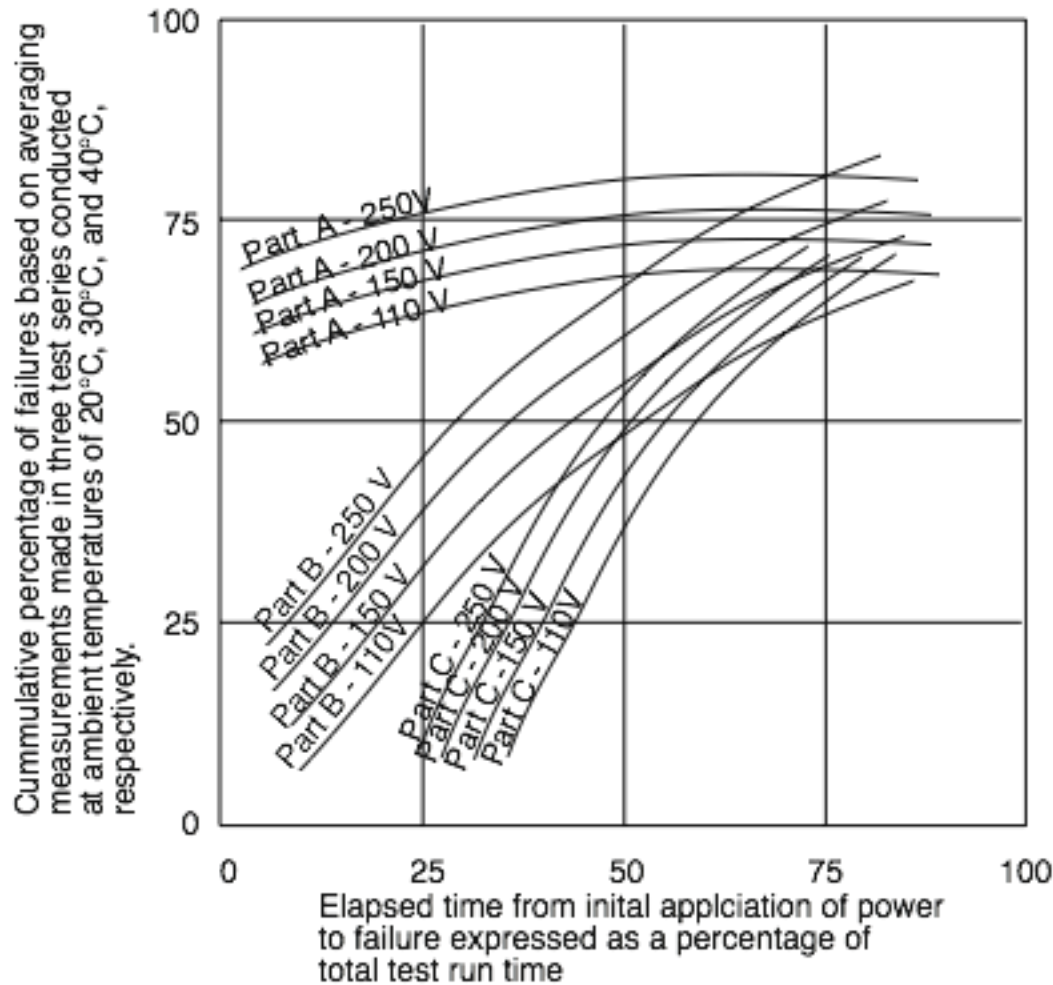
- » ~1 dB or better from 5-10 GHz
- » Better than 3 dB from 300 MHz – 10 GHz

Multi-Layer Fragmented Radiators Key to Performance at Upper End (Better than 1 dB Insertion Loss)

Complicated Plots

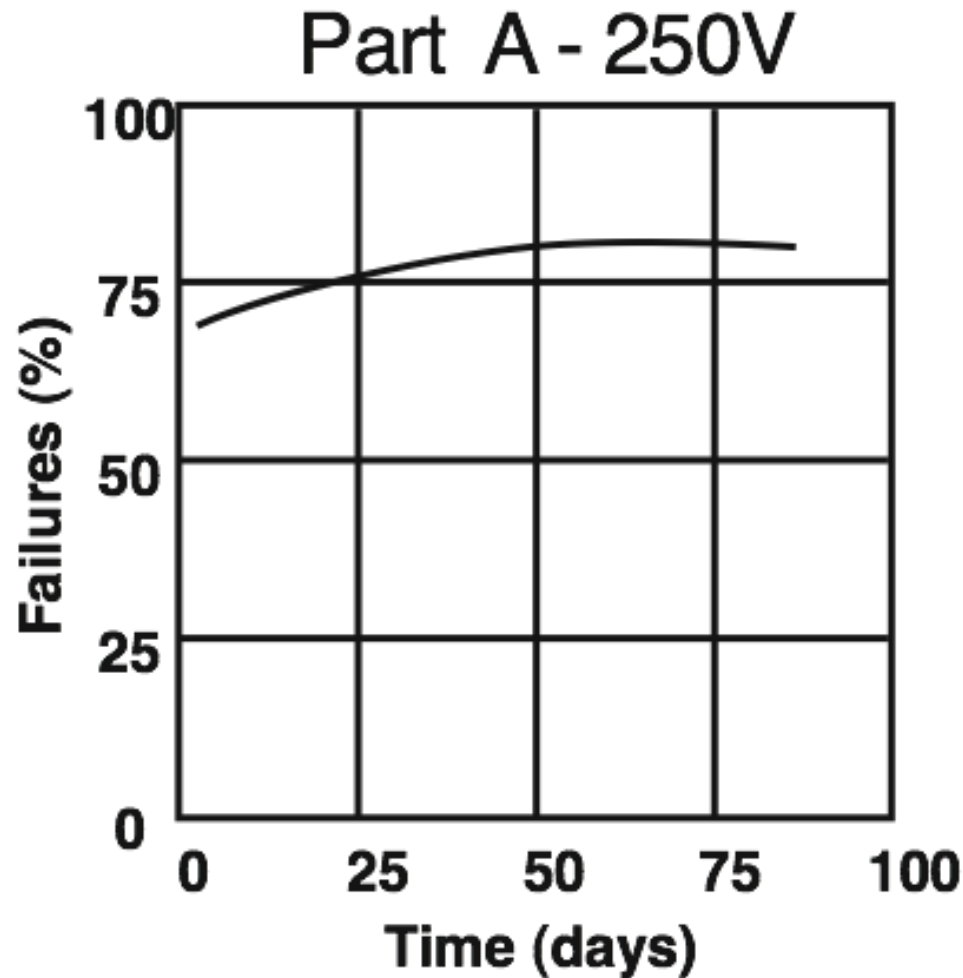
- As with any complicated stuff:
 - » Start with easy idea
 - » Gradually add complexity, explaining each step
 - Slides are cheap! (when I was young...)
 - » Build up to complete plot
 - » Explain what you're looking for
 - » Point it out

Suppose you want to present:



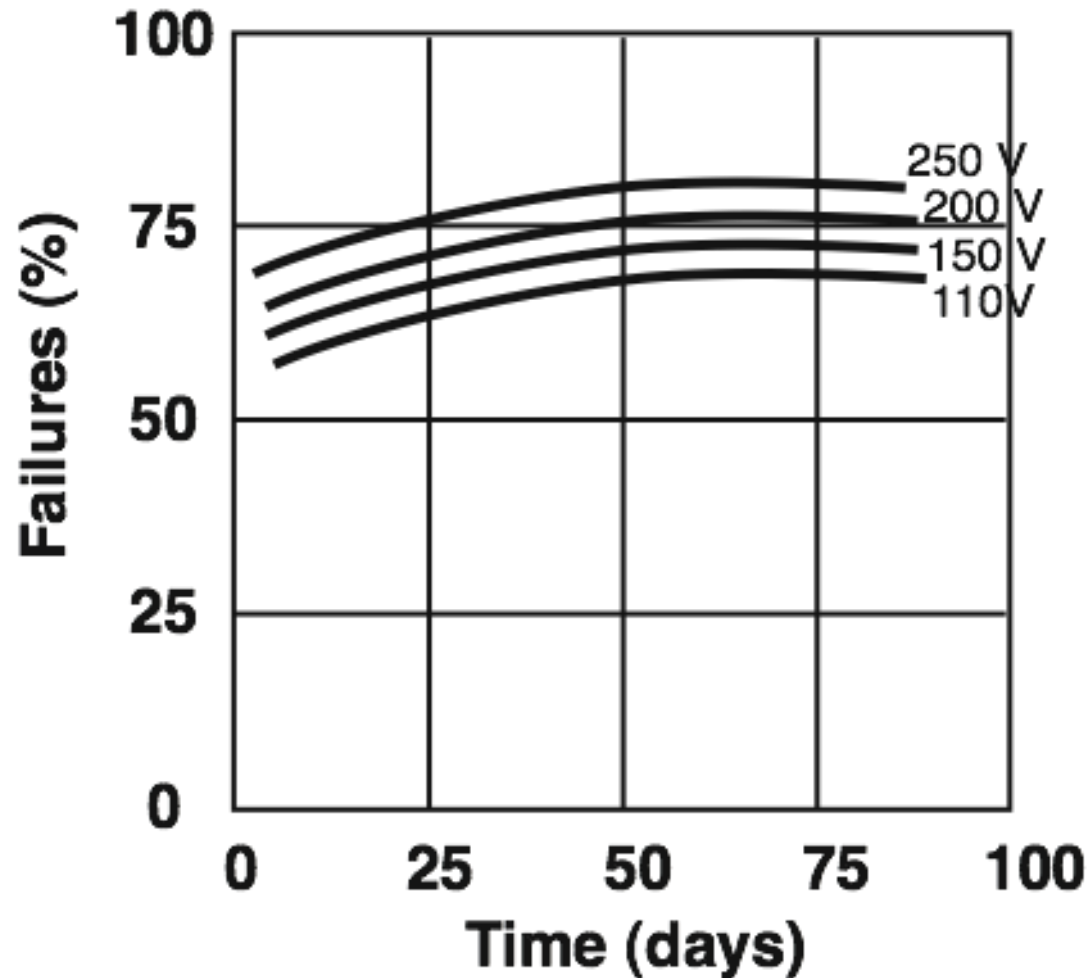
After R. M. Woefle, Ed., *A Guide for better technical presentations*, IEEE Press, New York, 1975.

Start with this:



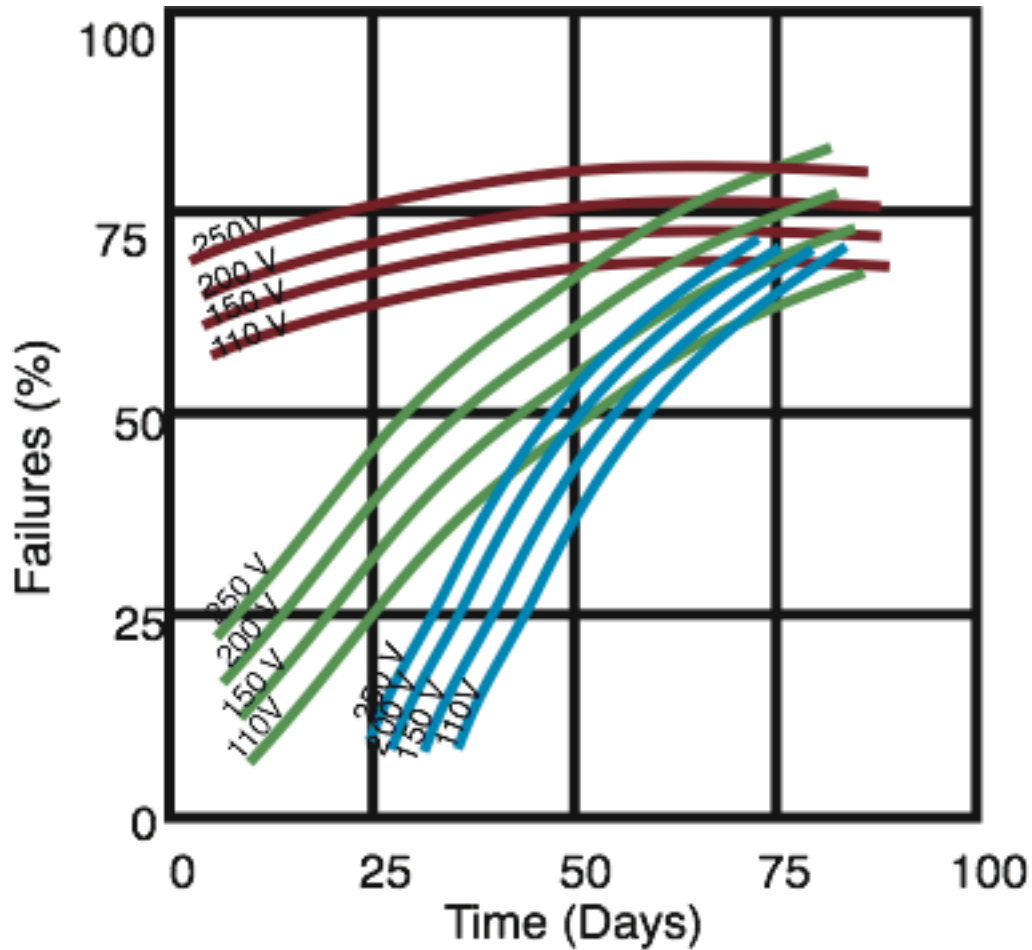
After R. M. Woefle,
Ed., *A Guide for
better technical
presentations*,
IEEE Press, New
York, 1975.

Add other lines for same part



After R. M. Woelfle,
Ed., *A Guide for
better technical
presentations*,
IEEE Press, New
York, 1975.

Then add other parts



After R. M. Woelfle,
Ed., *A Guide for
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Use of Color

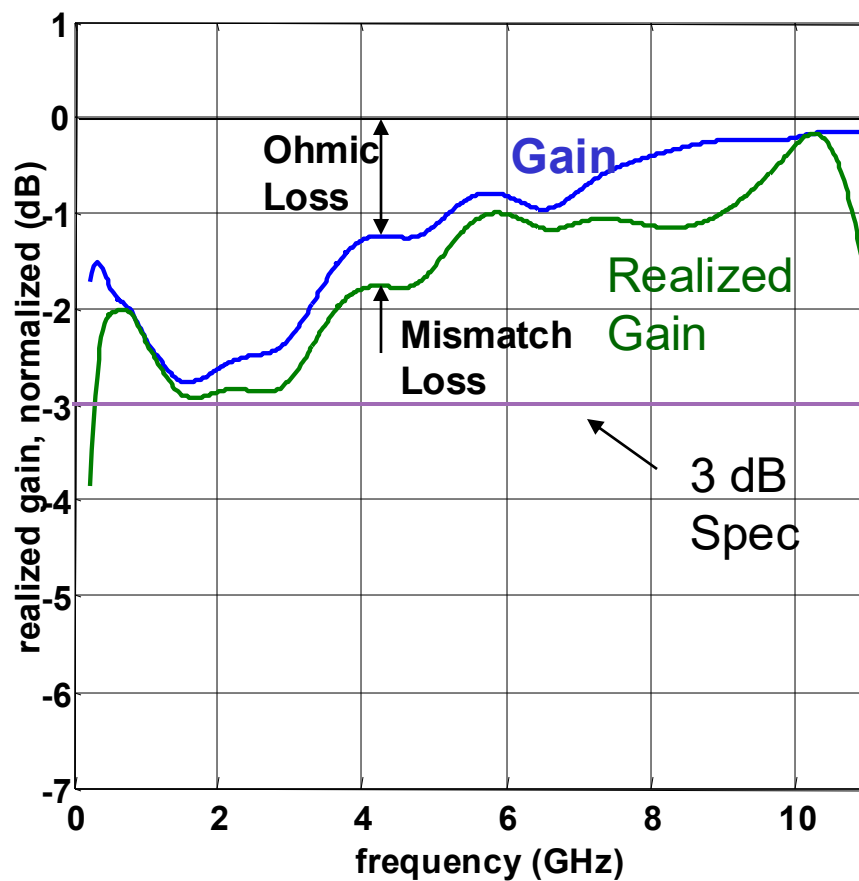


Find the round things

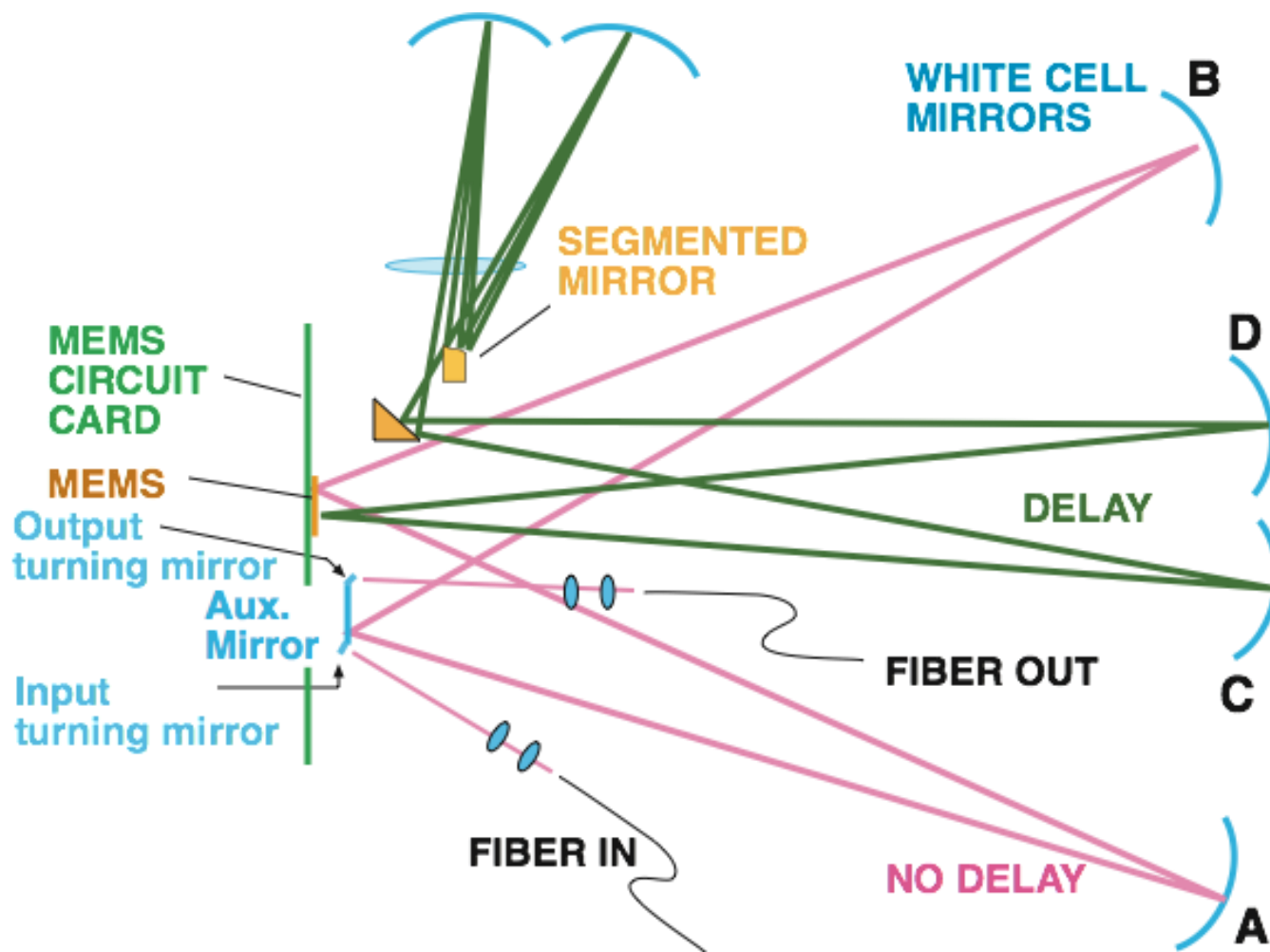


Find the pink things

Use color to relate things



Another example

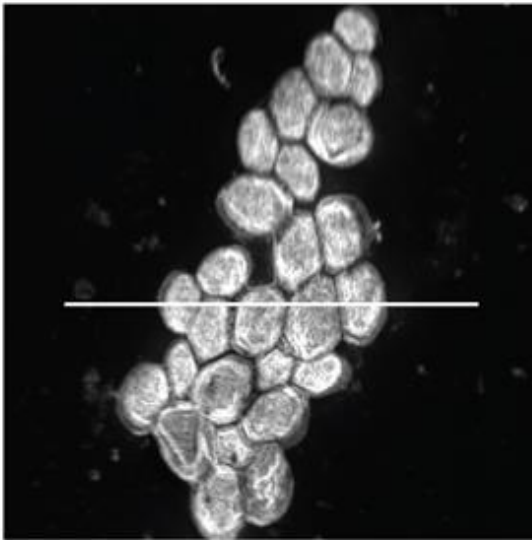


Make your slides accessible for those with color blindness

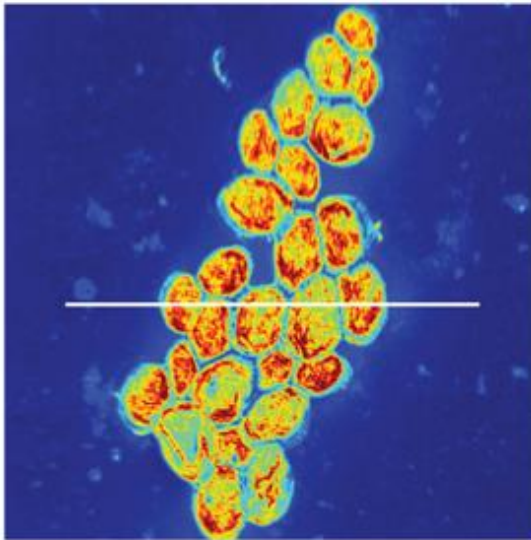
- “Many people can’t easily distinguish red and green
- Avoid red, green, and orange in templates
- Use texture in graphs, instead of color, to highlight points of interest.
- Circle or use animation to highlight information, rather than relying on laser pointers or color.
- Keep the overall contrast in your presentation high.”

Research: Cividis is best

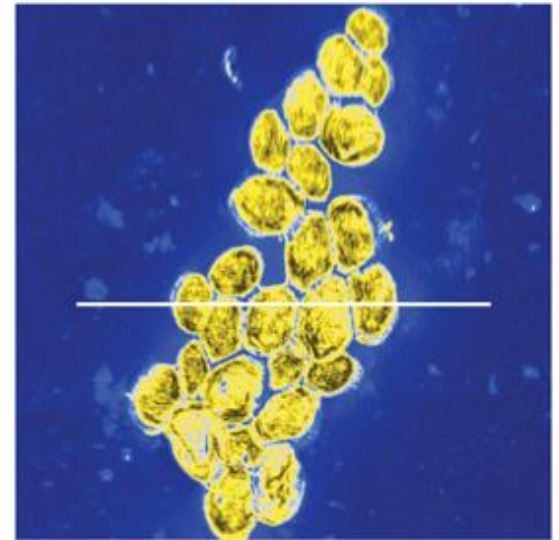
a) Grey



b) Jet



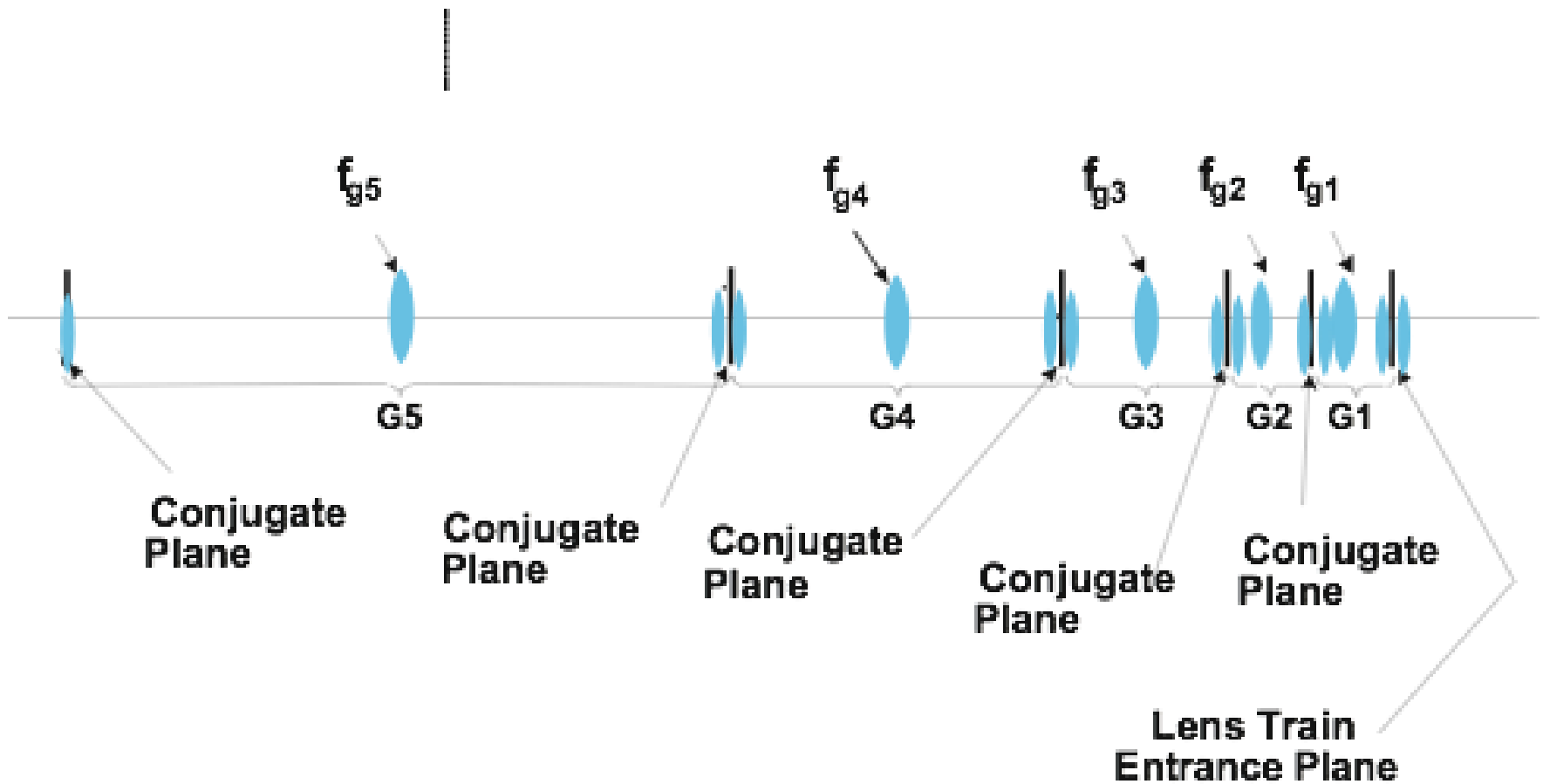
c) CVD-Jet



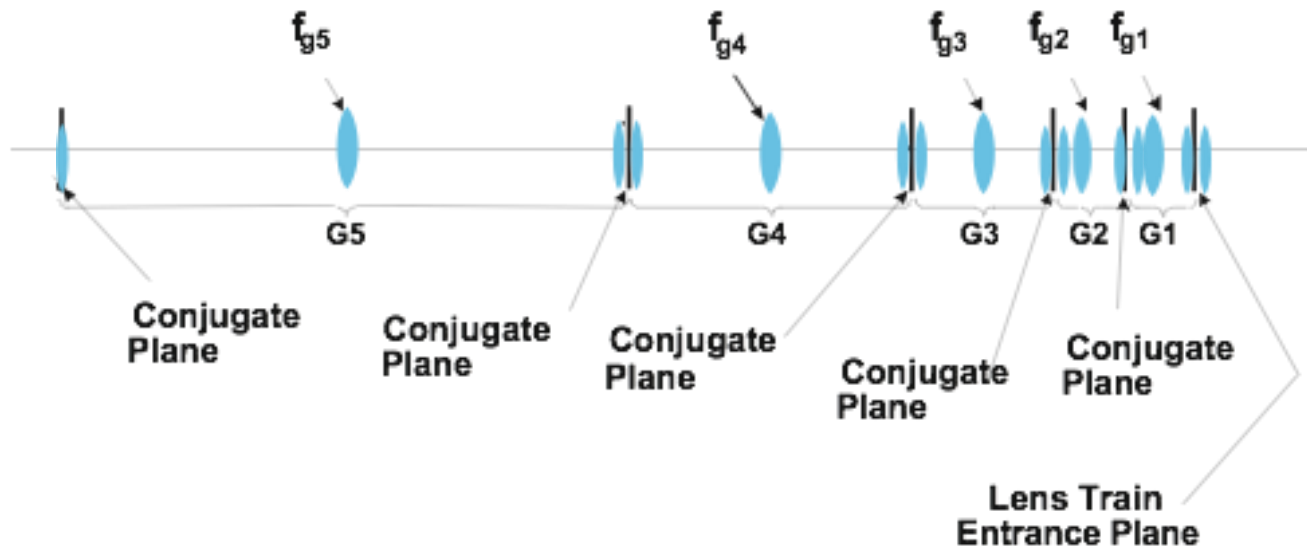
Animations can be really irritating!!

- Wastes time
- Shows you don't have enough to do
- Spend your time on the content!
- Too much glitz weakens your presentation (especially among engineers!)

But they can be very effective, too



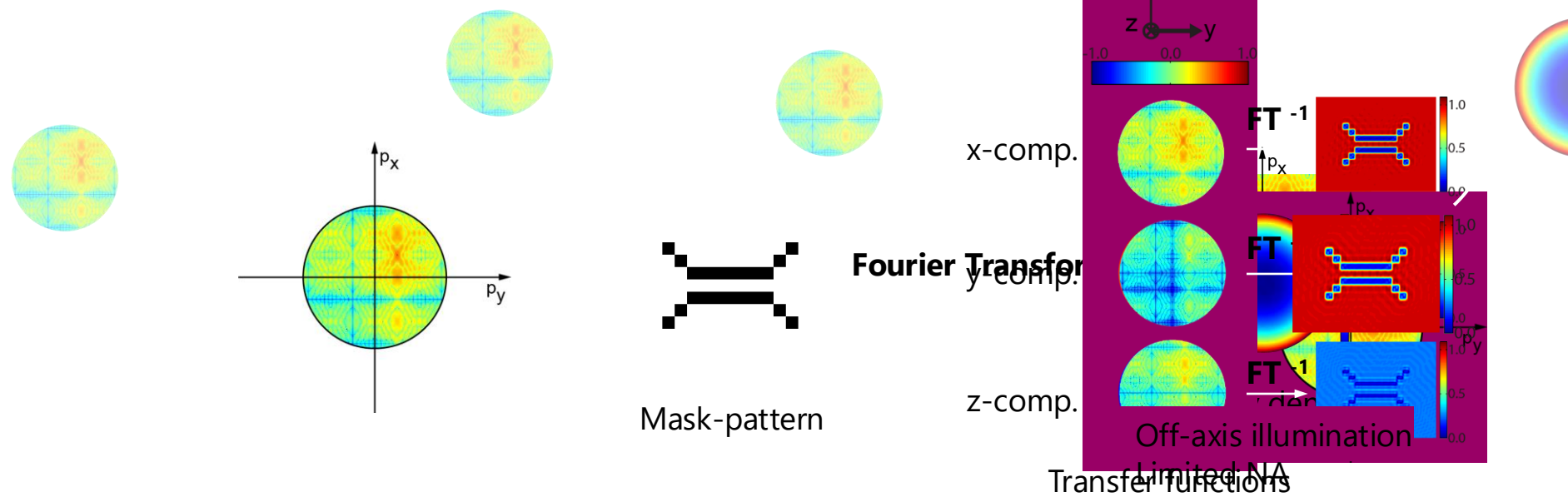
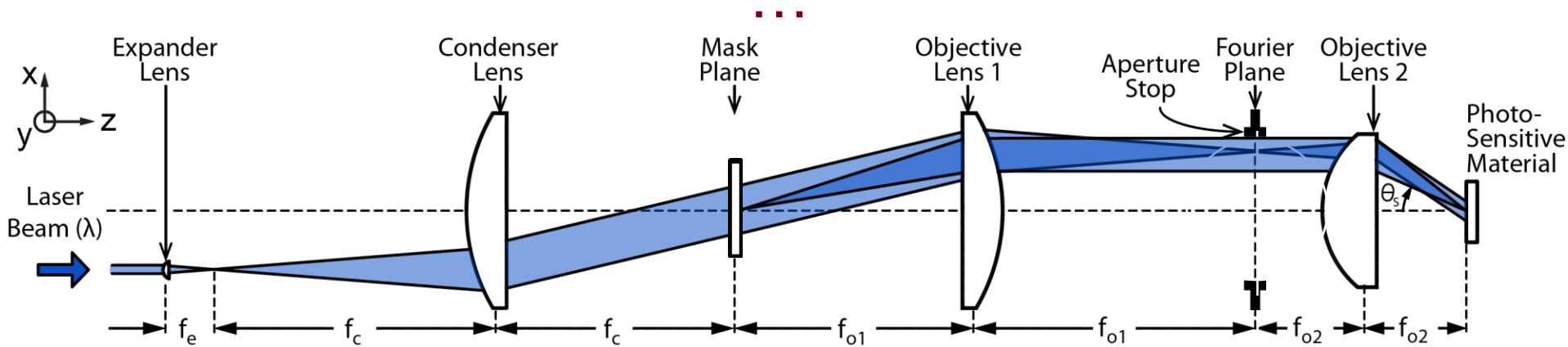
But they can be very effective, too



- In this case- shows clearly what's different
- Builds up complexity gradually

PIIL modeling

Combining off-axis high-NA imaging modeling

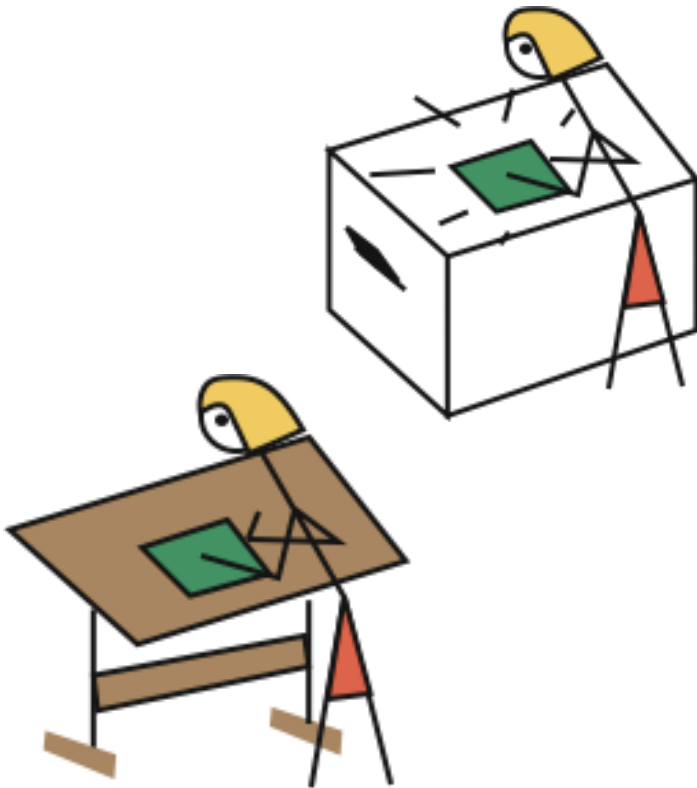


Courtesy [Matthieu Leibovici, Georgia Tech](#)

CITATIONS

- You **MUST** cite all non-original material
- Remember, the person who wrote that paper might be in the audience
- Or her best friend...
- Or one of his students...

CITATIONS continued



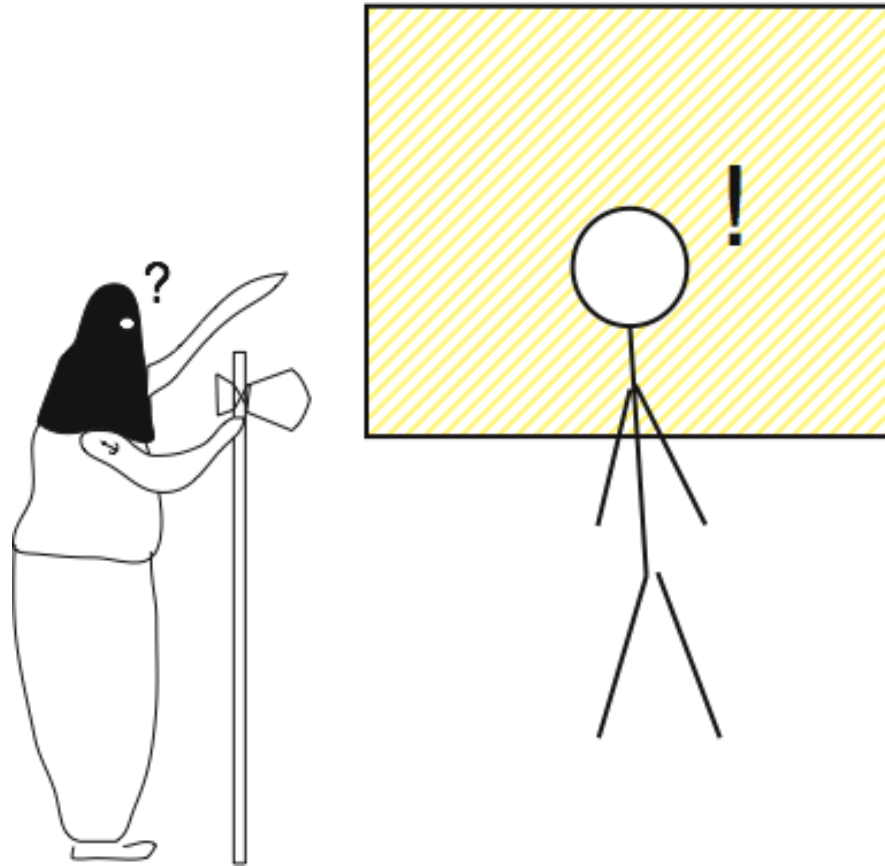
- If you REPRODUCE it (photocopy or scan), cite FULLY on the slide
- If you REDRAW or modify it, say “After” and cite it FULLY on the slide
- Don’ t forget to cite pictures you get from the internet!

After Anderson, et al, *Proceedings on Stuff I Made up*, (36)3, pp. 245-139, 1998.

Number your slides

- Makes it easy for people to ask you questions
- Speaking of questions...

The dreaded Question and Answer period



Relax, it's not that bad

- People are on your side (really!)
- You'll know answers to 80% of ?'s
- OK to say “I don't know”
 - » “I haven't looked into that aspect.”
 - » “I'm not familiar enough with the piezoelectric devices to give you a good answer.”
 - » “That'd be an interesting question to look into.”
 - » “I don't know, but maybe someone else here can answer that.”

How about that nasty guy?

- Happens rarely
- Makes everybody mad- they' ll side with you
- What does he REALLY want?
 - » Wants to show what *he* knows?
 - » Wants to hear himself talk? (sometimes an answer isn' t necessary, just an acknowledgment)
 - » Genuinely wants to put you down? (very rare)

Traps to watch for:

- Hypothetical question:
 - » “Suppose I used your device to jack up my car. What would happen?”
- You don't have to answer it! How should you know?
- Response: “I don't know. I haven't looked into that application.”
- Don't BS. Don't guess. Don't speculate.

Loaded preface:

- “Given the deservedly low regard for...”
- “Do you mean to tell me...”
- “Since all you big companies get together to set your prices...”
- Don’t ignore it, address it: “I’d be happy to address your question, but first let me address your allegation...”

Loaded words

- Failure, overrun, delay, swindle, too (small, impractical, expensive)
 - » “The poor design of your laser makes it impractical for jacking up cars...”
- Reword the question
 - » “The question was, why was the laser made from a semiconductor chip instead of industrial steel...”

Go from defense to offense

- “Clearly we have a difference of opinion here...” Terry C. Smith, “Making Successful Presentations, Wiley 1984
- If they won’t drop it, offer to discuss it privately after the session
 - » Makes it easier for you to blow them off
 - » Makes it so no one else overhears
 - » Doesn’t waste audience’s time

Your behavior

- Try not to sway, fidget, rap the screen, click your pen, jingle your change
- Do not ignore interruptions, acknowledge them
- Do not apologize for bad slides, unclear pictures...
- Do not read from a script (if you can help it)

Laser Pointers

- Point to what you're talking about
 - » Especially if you're hard to understand
- Don't wave it wildly
- Don't turn it on and off too quickly
- Let people see the point, then follow it to *your* point

Do:

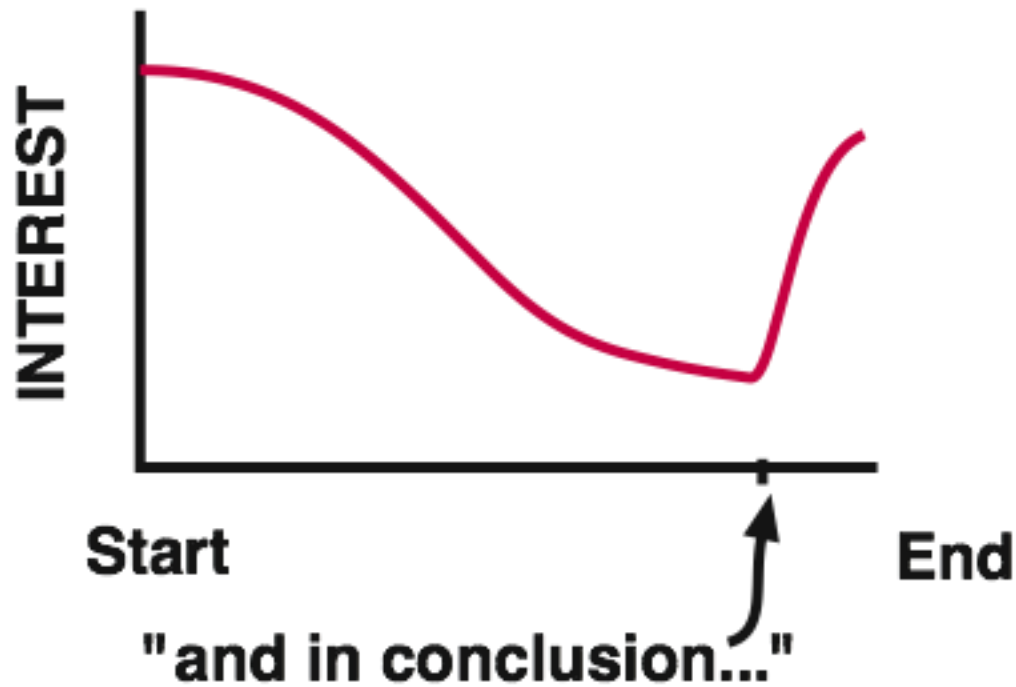
- Smile (puts people at ease)
- Make eye contact (makes them pay attention)
- Take a deep breath before starting
- Pause for effect
- Show enthusiasm
- Repeat your key points
- Repeat your key points

Finally...

- Remember to state your key points more than once
- Short, internal summaries
- Tell ‘em what you’ re going to tell ‘em, tell ‘em, tell what you told ‘em
- Be sure to summarize your keys points

Be sure to spell-check your slides

I lied, we aren't done yet



Conclusions:

- A talk is not a paper
- Can't cover everything
- Restate your main points in different ways
- Simplify your slides
- Practice your talk

Questions?

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