

What makes a good talk?



Astrophysics made simple

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With thanks to Brian DeMarco for useful suggestions

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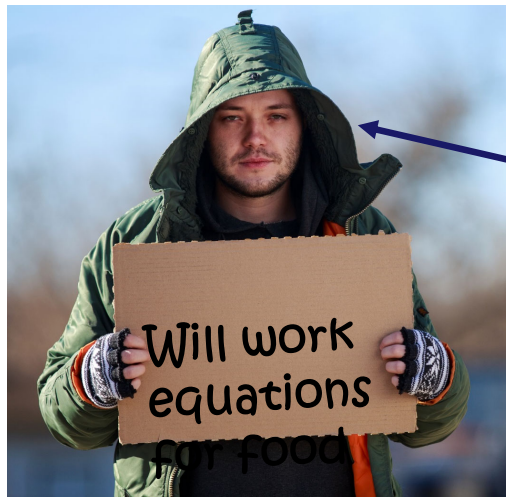
One of our goals for this class is not only to teach you how to present good talks, but also how to listen to them.

A good communicator recognizes the three major constraints on speakers and plans his talk with them in mind:

1. Who is the audience? What is their level of expertise? How motivated are they to listen? What is likely to confuse or bore them?
2. What is the purpose of the talk? To present new results? To inform? To solicit feedback on a new idea? To entertain? To get a job?
3. How much time has been allotted? It takes about 5–7 minutes to adequately motivate, explain, and summarize one main point in an oral talk. A speaker cannot cover six main points in a 10-min. APS-style presentation, no matter how fast he talks.

As you listen to a talk, ask yourself how well the speaker planned for these three constraints.

Why listen critically?



Physicist who never learned to give good talks

- **Listening to talks and evaluating them critically will make you a better speaker**
- **Learning to give effective talks will have enormous benefits for your future career success, whatever your path you pursue**

Giving good talks is a skill.

And like any other skill, it requires learning techniques, practicing them, getting feedback, and listening to a *lot* of talks so that you learn to recognize excellence and emulate it.

IN THIS LECTURE WE WILL

Learn to evaluate talks analytically and critically—think about the delivery as well as the scientific content

Excellent advice from Professor DeMarco:

“Few people take the time to evaluate a talk that they have heard. Doing so is really the key to learning how to give a better talk.

“If you want to become a better speaker, after giving or listening to a talk ***every time***:

Think: What was ineffective about the talk? What are a few things that could be improved? Be specific. Try to identify details and larger issues.

Think: What was effective? Find three things. Be specific. Try to identify details and larger issues.”

To start with...Some practical tips

- All talks start with the **abstract** — so read it before you go
- **Take notes** — preferably on paper
 - do not let yourself check your phone
- **Identify** details as well as larger issues
 - What was effective?
 - What could have been done better?
 - What do I want to emulate?

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What makes a good talk?

Did you learn something interesting?

Were you engaged?

- Talk should be structured well/pedagogical
- Talk should establish the Why, How, What, and Conclusions
- Talk should be targeted to specific audience
- Talk should have good presentation and delivery

If you didn't like a talk, don't assume it's "your problem." There is a surprising universality to good or bad talks.

There are very few boring topics. I've seen great talks on the smallest results. And terrible talks on really exciting research.

Structure: Why, How, What, Conclusions

- **Background and Motivation:** Why should you care? How well does the speaker convey the importance of the results and the bigger picture they fit into?
- **Clearly explain the methods used:** How was the work (theory or experiment) done? What cool new tools did they develop or use?
- **What did they find?** What was the primary discovery?
- **Circle back to the motivation?** How did their discovery move the field forward?

The why, how, what, and conclusions

Structure of talk: Does the talk tell a Story?

A good talk tells a story:

**There should be a
beginning
middle
and end..**

**The way to tell a story is to identify the most important
points you want the audience to take away from the talk**

Then weave your story around it

Unlike printed materials, where we can flip back and reread something if we need to understand it before proceeding, we cannot “rewind” an oral talk. Good speakers anticipate this need and tell you the important points more than once.

Common advice to speakers is to tell the audience your important points three times:

1. Tell them what you’re going to tell them (preview).
2. Tell them (body of the talk).
3. Tell them what you told them (summary at the end).

Take it from a mother, telling somebody something important three times is **not** overkill.

Structure of talk: important points (IPs)

The important points should be previewed at the beginning of the talk

**What was discovered (through calculations or experiment?)
(The cool physics)**

How was it discovered? (Any special techniques?)

What are the implications of the discovery? (Why should we care?)

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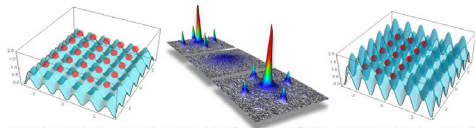
The important points should be previewed at the beginning of the talk

Adhere to the speaker's "Rule of 3":

- tell 'em what you're going to tell 'em
- tell 'em
- tell 'em what you told 'em

An outline slide can be used for longer talks

Superfluid to Mott Insulator Transition in Ultracold Atoms



M Greiner et al., Quantum Phase Transition from a Superfluid to a Mott Insulator in a Gas of Ultracold Atoms. *Nature*, 415(6867):39-44, JAN 3 2002.

Outline

- History and Background
 - What are superfluids and Mott Insulators?
 - What work led up to this paper?
- Theory
 - Bose-Hubbard Model (*BH*)
- Summary of paper
 - Experimental Realization of *BH*
- Critique
- Citation Evaluation

Example from a PHYS 596 journal club talk

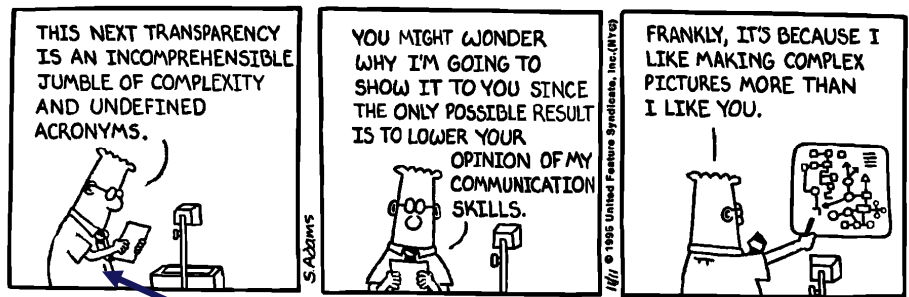
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The important points (IPs) should be clear



Scientificus physicus

Did the speaker emphasize IPs and explain *why* they are important?

Was the talk logically structured around the IPs?

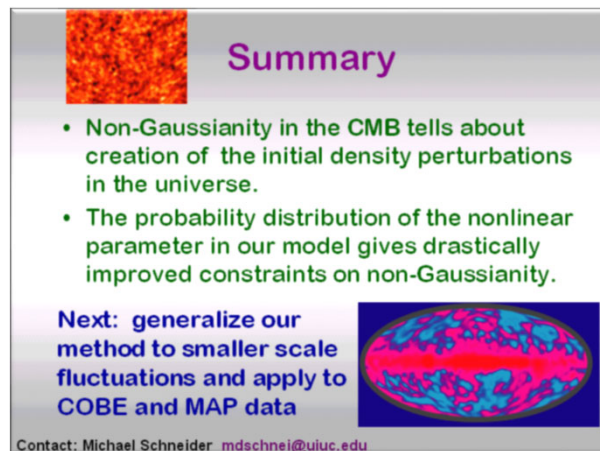
Were figures used to make IPs memorable?

Every aspect of a talk should be evaluated in light of the overarching goal for giving the talk: How well does this aspect (the title, the appearance of the slides, the structure of the talk, the language, the figures, the summary) help my audience understand the important points that I'm trying to communicate?

The important points are reiterated at the end of the talk (“Rule of 3”)

Recap key results

Reiterate principal conclusions



Summary

- Non-Gaussianity in the CMB tells about creation of the initial density perturbations in the universe.
- The probability distribution of the nonlinear parameter in our model gives drastically improved constraints on non-Gaussianity.

Next: generalize our method to smaller scale fluctuations and apply to COBE and MAP data

Contact: Michael Schneider mdschnei@uiuc.edu

The speaker should provide a summary slide that recaps key points and cues the audience that the Q&A is about to start. The summary slide should help people review what they’ve learned and remind them of questions they want to ask.

Slide design: critical part of any presentation

- Organize slides by the point you are trying to make: present one idea in one slide
 - Is it easy to identify the physics point being made, or is a lot of extraneous information included?
 - Are the slides visually **confusing**?
 - Are the slides visually **distracting**?
- Figures should be useful and legible
 - Are figures legible? Can you read the axes? Do you understand what's being plotted?

Slide design: Figures, graphs, equations

Figures inform, clarify, and give evidence for important points

Improving the Cooling of Blades and Vanes in Gas Turbine Engines

- To increase efficiency, gas turbine engines have to run at higher power
- Better cooling schemes can dramatically affect the life of blades and vanes in gas turbines

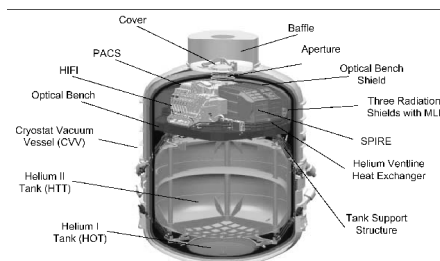


eye candy

Most people remember images much longer and more clearly than they remember words. Every illustration shown in a talk should be directly related to one of the speaker's important points and should explain, amplify, or clarify it.

If somebody else's figure has been used, the speaker 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—a photograph or drawing of something should include some sort of visual clue to its scale. The audience may have no idea if the apparatus shown below is something that sits on a tabletop or has to be hauled around on a truck.



Slide design: Figures, graphs, equations

Graphs and tables are kept simple

Verbosity Index

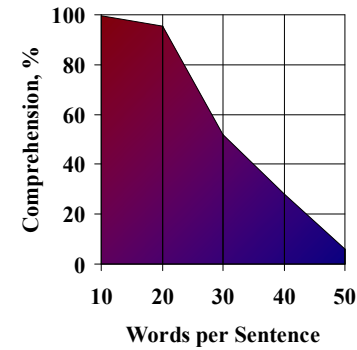


Illustration only, does not represent actual data

Women in Top-Ranked Physics Ph.D. Programs (1998)

University	NRC Rank/Score	PhD Students	Women %	PhD Recipients % Women
Harvard	1 / 4.91	149	13	14
Princeton	2 / 4.89	110	13	3
MIT	3 / 4.87	315	10	12
California-Berkeley	4 / 4.87	283	9	8
Cal Tech	5 / 4.81	154	18	8
Cornell	6 / 4.75	182	18	12
Chicago	7 / 4.69	154	14	6
UIUC	8 / 4.66	295	8	7
Stanford	9 / 4.53	135	13	12
California-Santa Barbara	10 / 4.43	117	13	5

Regrettably, *does* represent actual data, but we've improved substantially since 1998

Was their relation to IPs clear and immediately obvious?

The example on the left shows how a plot can quickly show a trend or reveal an underlying relationship. The actual numerical data are not as important as the slope of the line.

Note also that this plot has axis labels and tick marks that are large enough to be seen by somebody sitting in the back row.

The example on the right shows how tabular data can be presented in a form that people listening to a talk can immediately process. Highlighting the relevant line conveys the main idea—that Illinois was ranked far down the list. The audience probably doesn't care that Illinois's score was 4.66 and Harvard's was 4.91; they care that Illinois is ranked toward the bottom of its peers, and its percent of women was in single digits. (We've improved substantially since 1998.)

Slide design: Figures, graphs, equations

Equations are tied to important points and are needed to understand them



$$\frac{\partial^2 u(x,t)}{\partial t^2} = \sum_{m=0}^N \left(b_m \frac{\partial^m}{\partial x^m} \right) u(x,t)$$

Did the speaker...

Define terms?

Talk through the equation step by step?

Explain relevance?

Make equations large enough to be easily read?

The talk should build up to technical results. In general, too much technical information can be exhausting and off-putting; but too little can be unconvincing or facile

Equations should not be sprinkled thoughtlessly through talks; they should be used only when they're essential to understanding one of the speaker's key points. It's often helpful to substitute words for blocks of standard terms in equations; words are usually easier for the audience to process.

Here's an example:

$$\Gamma \propto (\text{phase space}) \times M_{ij}$$



Engaging the audience

Engaging the audience: Good talks are presented at a level appropriate for the audience

A successful talk must be tailored for the listeners

One needs different presentations for:

Group meeting

Colloquium talk

Seminar talk

Report to a boss, customer, or funder

Job interview

Club or volunteer group



It's ok for a talk to entertain and educate. 10 minute attention span. Adding cartoons to general audience talk –

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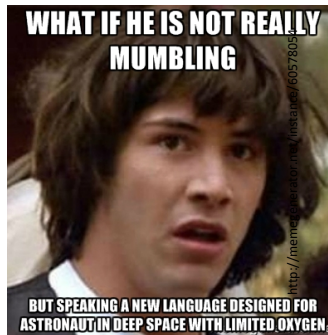
Engaging the audience: The speaker maintains a uniform pace throughout the talk



No skipping slides or rushing to cover half the talk in the last 5 min

A speaker should maintain an even pace throughout the talk, not rush through the last 10 slides in a panic because he failed to rehearse and check his timing.

Engaging the audience: The speaker enunciates words clearly and distinctly and speaks in a conversational tone of voice



No mumbling
No monotone
No sing-song intonation

Even if you're a native English speaker, remember that many members of your audience may not be. Slow down and pronounce every word distinctly.

If you're a non-native English speaker, slow down and pronounce every word distinctly.

Factor the need to speak slowly and distinctly into your calculations of how much material you can cover in your allotted time.

Engaging the audience: Questions are handled appropriately

Did the speaker:

Ask for questions at the end of the talk?

Repeat a question so everyone in the room heard it?

Treat questioners with respect?

Respond appropriately if he didn't know the answer?



Learning how to handle questions is an important skill for all speakers. Later on in this class we'll explore strategies for you to use to master questions.

Engaging the audience: No annoying mannerisms

Pacing, arm-waving, distracting gestures

Verbal fillers, “and, um, like...you know”

Jingling keys or coins

Fiddling with the microphone

Forgetting to TURN OFF the damned cell phone or other electronica

Turning away from the audience and reading off the screen

Laser-pointer acrobatics



Did the speaker have any annoying mannerisms that made it hard for you to pay attention? Make note of them and resolve to correct your own bad habits.

To recap...

**Did the talk meet the needs
and expectations of the audience?**

**Did the speaker cover an appropriate amount
of material?**

**Did the talk have a clear beginning, middle,
and end ?**

Were the main points clear and memorable?

Did the talk seem conversational but polished?

Did the speaker finish on time?!



NOTES: