

# Physics 496

## Introduction to Research

Lecture 1.2: Evaluating a Science Talk  
(From CME)

### What makes a good talk?

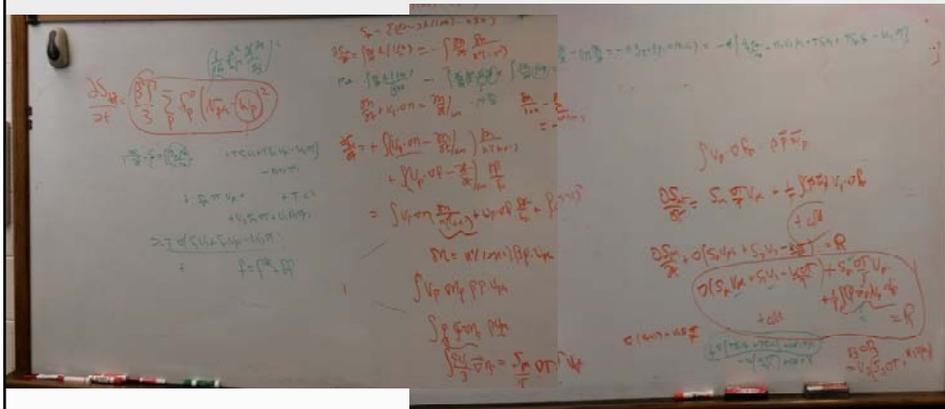
What material you present

What you say and how you say it

Physics Made Simple

And even what font you use (more on this later)

You think such boards don't exist?



Purpose: Communicate ideas!



**This fundamental goal should govern every aspect of the design and presentation of a talk!**

## Who is the audience?

A working group?  
 A funding agency?  
 Colleagues at a conference?  
 A Potential employer?  
 The general public?



A successful talk is tailored to the audience.

- If it is at too high a level, the audience won't learn anything.
- If it is at too low a level, the audience won't learn anything.



## The speaker previews the important points at the start

Gives an outline of the talk\*

Previews key topics

- A) The evergreen Regge formalism  
 RFT and pQCD
- B) Direct measurement of  $\sigma_{\text{inel}}$ :  
 1) cosmic-ray experiments  
 $\sigma_{p\text{-air}}, \sigma_{pp}$  via Glauber models  
 2) collider experiments  
 $\sigma_{\text{inel}}$  for specific final state
- C) Measurements of diffraction:  $\sigma_{\text{SD}}, \sigma_{\text{DD}}$
- D) The art of elastic scattering:  
 1)  $\sigma_{\text{el}}$  and  $\sigma_{\text{Tot}}$  via the optical theorem

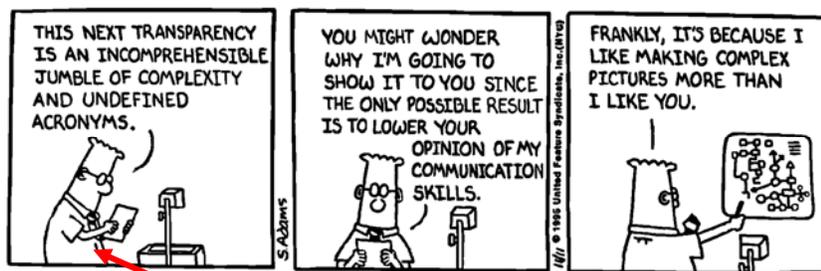
Beware of über-detailed outlines!

And of speakers who read every word of their outline.

It's just a guide to prepare the listener for what will be covered.

\*More important for longer talks

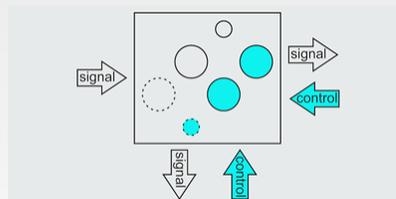
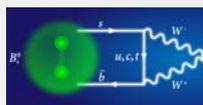
## The important points (IPs) are clear



*Scientificus physicus*

- Language and detail are appropriate for the audience
- Speaker emphasizes IPs and explains *why* they are important
- Talk is logically structured around the IPs
- Figures are used to make IPs memorable

## Figures are used to clarify or emphasize important points



They can also be used to break up the text on slides and make them easier to read and follow.

But the figures should be relevant to the talk and the speaker should describe them and explain what they show.



## Graphs and tables are kept simple

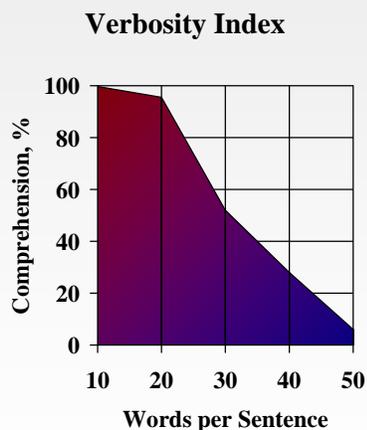


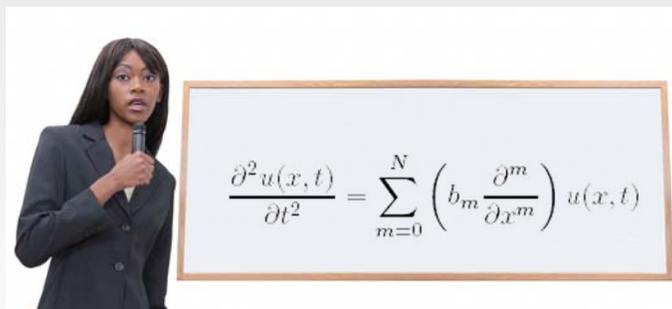
Illustration only, does not represent actual data

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

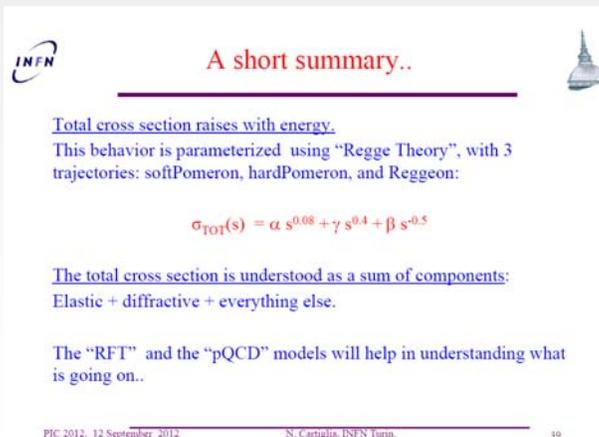
## Equations are tied to important points and are needed to understand them



- Did the speaker...
  - Define terms?
  - Talk through step by step?
  - Explain relevance?
  - Make equations large enough to be easily read?

## The important points are reiterated at the end of the talk

- Recap key results
- Reiterate principal conclusions



**INFN** 

### A short summary..

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Total cross section raises with energy.  
This behavior is parameterized using "Regge Theory", with 3 trajectories: softPomeron, hardPomeron, and Reggeon:

$$\sigma_{TOT}(s) = \alpha s^{0.08} + \gamma s^{0.4} + \beta s^{-0.5}$$

The total cross section is understood as a sum of components:  
Elastic + diffractive + everything else.

The "RFT" and the "pQCD" models will help in understanding what is going on..

PIC 2012, 12 September 2012 S. Cattalia, INFN Turin 39

## Questions are an essential part of a scientific talk

- Did the speaker ask for questions?
- Did the speaker repeat a question so everyone in the room heard it?
- Did the speaker treat questioners with respect?
- How did the speaker respond if s/he didn't know the answer?



## For your first homework assignment

- Attend the Undergraduate Research Symposium, January 31, 141 LLP, 2:00-5:00 PM
- Listen actively and attentively
- Think critically about the science being presented
- Take notice of speakers' strengths and weaknesses
- Identify styles you'd like to emulate (or avoid)
- Ask questions

## About the font...

### Short Sharp Science

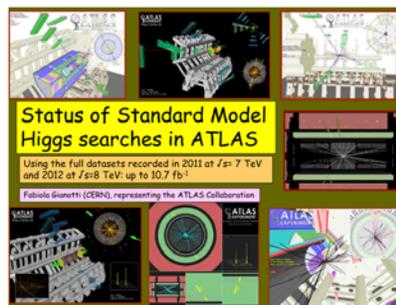
Cutting-edge science, cut up

#### Higgs in Comic Sans: the right font for physics?

17-18 & July 2012

Physics & Maths

Jacob Aron, reporter



(Image: CERN)

The Higgs results presented at CERN this week were met with applause and cheers from Geneva to Melbourne, but one group was less pleased: font devotees. That's because the slides of one of the two presenters, *Fabiola Gianotti* of the ATLAS experiment, bore text set in Comic Sans. The typeface mimics handwriting and is much maligned for its irreverence and overuse.

theguardian

News | US | World | Sports | Comment | Culture | Business | Environment | Science | Tr

Culture > Art and design > Comic sans

#### Higgs boson and Comic Sans: the perfect fusion

There is outrage on Twitter over Cern's use of Comic Sans on presentation slides. But if ever there was an announcement that needed to be made in an easy-to-read font, it's this one

Share (480)  
Tweet (345)  
+1 (34)  
Share (19)  
Email

#### CERN scientists inexplicably present Higgs boson findings in Comic Sans

By *Paul Appleby* for the Guardian



For many of us, the most shocking revelation to come out of CERN's Higgs boson announcement today was quite unrelated to the science itself. Rather, we were blown away by the fact that a team made up of some of the most undoubtedly brilliant people in the world believe that Comic Sans is an appropriate font for such a historic occasion. While criticizing the much-maligned typeface is almost an act of a crime as using it by



IN 1989: The Higgs boson: CERN to discover the elusive