The Art of Scientific Presentation

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Fallacy 1: Scientific presentations should primarily present information

Inform:
Describe your work.
Show the results you obtained

Persuade:
Is it an interesting and worthwhile question?
Was it a valid test?
Are the results accurate?
Significant?
Fallacy 2: Talks are like papers, except you present them out loud
**Fact:** presentations differ from papers in some very fundamental ways!

**Paper:**
Reader sets own pace
Can skip around in text
Can look up references

**Presentation:**
Audience has limited attention span
Can’t re-read text
Presentations have some advantages

Use **sights and sounds** to bring work to life!

Instant **feedback**
Can **adjust** presentation
An effective presentation depends on three important aspects of **style**

- Structure
- Visuals and Props
- Delivery
The structure of a presentation is strongly influenced by your constraints

- **Audience** (multiple?)
- **Format** (time limits, time of day, facilities)
- **Formality** (questions during or after talk?)
- **Politics** (Hostile or friendly audience?)
Presentations should have clear beginnings, middles, and endings
Beginnings prepare the audience for the work you are presenting

Define work

\[ \text{Work} = A + B \]

Show importance

Give background

Map presentation

A → B

C ← D
The middle presents the work in a logical order

pre-combustion methods

combustion methods

post-combustion methods
In the middle, make smooth transitions between major points

Pre-combustion methods

Combustion methods

Combustion methods

Post-combustion methods
The ending summarizes main points, and places them in the big picture.

Summary

Big picture
**Visuals** reflect the structure of the presentation

- **beginning**: scope, importance, background, mapping
- **middle**: logical order, transitions
- **ending**: overall perspective, summary

1 visual = ~1 to 1.5 minutes
Visuals serve the presentation in several ways

- Notes for audience during presentation
- Notes for audience after presentation
- Notes for speaker(s) before and during presentation
Well-designed visuals help the audience remember more of your presentation.
You must make certain decisions when designing visuals

What **format**?

What **information**?

`Included`\n\n`Excluded`
**Headline/body format orients the audience**

<table>
<thead>
<tr>
<th><strong>Headline</strong></th>
<th>Use a headline that concisely states the idea of the visual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body</strong></td>
<td>words</td>
</tr>
<tr>
<td></td>
<td><strong>Body supports with words</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Body supports with images</strong></td>
</tr>
</tbody>
</table>
Use strong headlines!

- Orient the audience
- Help define presentations structure
- Help keep speaker on track
The body supports the headline with words and images

Supports with words

clear
familiar
concise

Supports with images
Use large, legible type

Clear typeface: ✔ Arial
✗ BOOK ANTQUA

Large type (18-36 point)

- 12 point
- 14 point
- 18 point
- 24 point
- 28 point
- 36 point
- 40 point
Avoid clutter
Select body material that effectively supports your headlines

Images

Mars has two moons

Results

The world is warming

Six warmest years of the 20th century

1998
1997
1995
1990
1999
1991

The world is warming

Six warmest years of the 20th century

1998
1997
1995
1990
1999
1991
Include visuals that show organization

Beginning

Middle

Ending

Introduction

Topic A

Topic B

Title

A

B

Conclusion

Summary of A and B
Layout of Test beam System

TileCal Drawer

TTC Fibre
Laser Crate

TTC Fibre
Beam Crate

VME

SLink Fibre
ROD Crate

Note: 3in1 also uses CANbus

Workstation

ROB Crate
Step 1: Configure 3in1 and digitizer systems via TTCvi

To 3in1: Enable CIS, select capacitor, charge setting, etc.
To Digitizer: Read out Low and High gain, set number of readout samples, set pipeline length, etc.
All systems configured by Beam Crate using TTC (+ CAN?)
Step 2: Fire CIS pulse and read out digitizer data

L1A fires CIS pulse and starts readout

TileCal Drawer

Beam Crate

Laser Crate

ROD Crate

Digitizer data

VME
Step 3: Transfer event data to the event builder (ROB crate)
Step 4: Transfer data to workstation for offline analysis
Don't include information the audience doesn't need or can't remember

### Filler information

Roentgen discovered x-rays in 1895. He found that a cathode-ray tube produced fluorescence in a distant platinum-barium-cyanide screen.

### Complex math

\[
\frac{(x+2)^2 \ln x}{(x+1^3) (x^{21})}
\]

### Long lists

- Corrosion
- Acid rain
- Toxic materials
- Pulsed combustion
- Energetic materials
- Pyrogenic materials
- Smog

### Complex images

[Diagram showing DEARATOR, HOTWELL, RGF, A, B]
An effective delivery conveys your message to the audience

¥ Language
  – Familiar
  – Precise
  – Concise
  – Tone

¥ Performance
You have several choices for delivering your speech

<table>
<thead>
<tr>
<th>Memorize the speech</th>
<th>Read from a text</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ allows eye contact</td>
<td>+ ensures precision</td>
</tr>
<tr>
<td>- difficult for long speeches</td>
<td>- doesn’t sound natural</td>
</tr>
<tr>
<td>- room for precision errors</td>
<td>- no room to improvise</td>
</tr>
<tr>
<td>- no room for improvising</td>
<td>- hinders eye contact</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>“Wing it”</th>
<th>Speak from visuals/notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ sounds natural</td>
<td>+ insures organization</td>
</tr>
<tr>
<td>- much room for error</td>
<td>+ allows eye contact</td>
</tr>
<tr>
<td></td>
<td>+ allows improvising</td>
</tr>
<tr>
<td></td>
<td>- some room for error</td>
</tr>
</tbody>
</table>
Prepare strong wording to emphasize strong points or transitions

¥ Beginnings
   — OK: My name is _____ and I will be talking about
   — Better: One question which has come up more than once during this conference is: Now that the top quark has been found, what kind of physics can we do with it?

¥ Middles
   — That concludes what I have to say about cross sections. I will now discuss

¥ Endings
   — To summarize, I would like to show you this table of ...
An important part of delivery is your interaction with the audience.

Voice

Movements

Stage Presence
An effective presentation depends on three important aspects of **style**