Week 3

PREPARING AND GIVING TALKS

- Goal: Audience *learns* from what you present

- Need to learn this skill. Why?
  - Interview: get a job
  - Classroom setting:
    - help students learn a set of ideas
    - stimulate them to thinking about a topic
  - Science talk:
    - audience to learn what you have done and to be convinced of results & importance
OUTLINE

• Purpose of a talk
• Mechanics
• Good slides
• Structure of a good talk
• Constructing a good talk
• Answering questions
PURPOSE OF A TALK

• Help the audience to LEARN
  - know who they are
  - carefully define your goals for the specific talk: not too broad, not too narrow
MECHANICS

• Speak loudly and clearly: confidence – you know it, they don’t

• Stand relaxed facing the audience: move a little

• Use pointer as guide to the eye

• Eye contact - improves engagement, better hearing

• Avoid jokes: physicists are usually poor comedians

• Practice out loud, but not too much
  - get the words straight – only need about 2 run-throughs
  - get timing right from practice
  - do not sound as if you memorized it, except 1st two slides

• Stay within the allotted time!
MECHANICS (cont’d)

• Minimize physical manipulations needed by you
  - change slides and point without much movement and without blocking screen
  - don’t *plan* to write on the blackboard
  - don’t *plan* to use computer to write on slides
  - don’t *plan* to go back to a previous slide – repeat it
  - if possible, do not have separate paper with notes
    - use note panel on bottom on your screen
MECHANICS (cont’d)

• Make sure all is working before(!) you are scheduled to speak

• Presentations not 100% reliably moveable from one computer to another - fonts and figures can change

• Bring back-up copy on flash drive (embed fonts or use PDF)

• Hand out your slides?
  - only if audience must take extensive notes
GOOD SLIDES

• Audience is reading while you are speaking

• Simple text
  - phrases only, no sentences
  - only a few points per slide
  - big letters
  - careful with equations

• Keep formatting consistent – predictable, redundant
  - bullets, indentation, capitalization
  - position of material on the slide
  - format must serve your purpose
GOOD SLIDES (cont’d)

• How much animation to use (if any) ?
  - enough to keep their attention on your point
  - not distracting, keep it simple
    - this
    - or this
    - not this
• Simple pictures: don’t ‘hand wave’ if you can sketch
• Clear, simple graphs
  - good color coding in bright colors
  - take time to explain axes, curves, etc.
• Slides are your speaking notes
• Light type on dark background draw the eye to your message
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Materials

*Mucin:*
Porcine Mucus
Or
Porcine Mucus doped with a well characterized lipid to make it mimic lung mucus a little better
Or
A reconstituted mixture of MUC’s + lipid to build a well characterized model lung mucus

*Support:*
Needs to provide mucus layer with some mobility
Dialysis membrane with water on the other side and small enough pores to not let surfactant or dye through
Or
Layer of fluorocarbon liquid

*Surfactants:*
2 biologically motivated surfactants
one cationic and one anionic surfactant

*Water:*
Mucus should be mixed with x% water and y electrolye to match physiological conditions.
Air above the mucus layer must be maintained at saturation. (If we have a physiological reason to go below saturation, we can.)
rectly to the outer static meniscus by selecting the behavior shown in Eq. (5). Since $\text{Ca}$ is not large enough to satisfy the condition $\text{Ca} \ln(\alpha/L_{\text{ex}}) = O(1)$, $\omega_0$ deviates from Eq. (8) as shown by the data of Fig. 12.

At higher $\text{Ca}$, when $\text{Ca} \ln(\alpha/d) = O(1)$ as $\text{Ca} \to 0$, more viscous bending appears near the contact line. This prevents the inner film transition region from matching to a static three-region flow structure.\(^{2,33}\) Further, when the three-region regime is needed to describe the interface, the $\omega_0$-versus-$\text{Ca}$ relation follows Eq. (8). As predicted, thinner films approach this behavior sooner (i.e., at lower $\text{Ca}$) than the thicker films.

For the ultrathin films, we find that the HY model [Eq. (10)] (used here without the disjoining pressure term), which treats the ultrathin film as having the bulk fluid's properties, describes the interface shape near the contact line. We do not
March 15th A5 Fluid Trial 2

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BERNOULLI’S EQUATION GOVERNS FLUID FLOW

\[ p + \left( \frac{1}{2} \right) \rho v^2 + \rho g y = \text{constant} \]

- **Pressure head**
- **Kinetic energy**
- **Potential energy**

- \( p = \) pressure
- \( \rho = \) fluid density
- \( v = \) fluid speed
- \( g = \) acceleration of gravity
- \( y = \) height
STRUCTURE OF A GOOD TALK

• Title page
  - title
  - your name and affiliation
  - other possible information
    - collaborators (unless recognized elsewhere)
    - financial support (unless recognized elsewhere)
  - date
    - conference name
Oral Communication Techniques

Isaac Zweistin
(in collaboration with Albert Oldton)

Physics Department
Carnegie Mellon University
Pittsburgh, PA, USA
Photoproduction of Strangeness in Excited States

Reinhard Schumacher
Carnegie Mellon University

& Kei Moriya, PhD
for the CLAS Collaboration

October 1, 2013, Rome, Italy
STRUCTURE OF A GOOD TALK

• Title page

• Outline page
  - informative, not rote
Outline

• Introduction

• Apparatus and Procedures

• Results

• Conclusions
Outline /Overview

- Excited $Y^*$ cross sections measured at CLAS
  - $\Sigma^0(1385)$ ($J^P = 3/2^+$) in $\Lambda\pi^0$ channel
  - $\Lambda(1405)$ ($J^P = 1/2^-$) in 3 $\Sigma\pi$ channels
  - $\Lambda(1520)$ ($J^P = 3/2^-$) in 3 $\Sigma\pi$ channels
- Isospin interference in $\Lambda(1405)$: line shapes
- Spin & parity $J^P$ of the $\Lambda(1405)$
- First Electro-production of $\Lambda(1405)$
- Conclusions re progress in $N^*$ physics
STRUCTURE OF A GOOD TALK

- Title page
- Outline page
- Introduction
  - what you did (briefly)
  - why you did it
  - background science

- How you did your work
  - apparatus
  - procedures

- Results
  - what did you find
  - use graphs and pictures

- Conclusions
  - what you have learned from your results
  - main points they should remember
CONSTRUCTING YOUR TALK

• Know your audience – professionals or lay people? Students? Experts?

• Decide what few points you want them to remember: ~3 in 45 min. talk

• Plan your talk in reverse order:
  - define main points you want to conclude with
  - show evidence that proves your conclusions
  - show experimental details of how you got your results
  - give ideas motivating the project

• Say ONLY what leads audience to grasp main points – no “detours”

• You can’t start too simply

• Tell them 3 times
  - tell them what you want them to learn (outline, introduction)
  - tell them your story (body of talk)
  - remind them what you told them (reiterate main points)
USE REPEATED IMAGES AND PHRASES

• Aids listener in remembering points

• Repeat picture if you refer to it several times

• Use similar phrasing if you need to repeat an idea

• Following example uses repetition from Outline to Summary:
Outline /Overview

- Excited $Y^*$ cross sections measured at CLAS
  - $\Sigma^0(1385)$ ($J^P = 3/2^+$) in $\Lambda\pi^0$ channel
  - $\Lambda(1405)$ ($J^P = 1/2^-$) in 3 $\Sigma\pi$ channels
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- Isospin interference in $\Lambda(1405)$: line shapes
- Spin & parity $J^P$ of the $\Lambda(1405)$
- First Electro-production of $\Lambda(1405)$
- Conclusions re progress in N* physics
Differential $\Lambda(1405)$ Cross Section

- $\gamma + p \rightarrow K^+ + \Lambda(1405)$

- Experiment: each $\Sigma \pi$ channel yields a different cross section (Not expected!)

- Indication of isospin interference in $\Lambda(1405)$ mass region
  - threshold $< m_{\Sigma \pi} < 1.50$ GeV

Summary/Conclusions

- First comprehensive $\gamma p \rightarrow K^+Y^*$ cross sections for the first three excited hyperons, all current models show (fixable?) deficiencies

- New interference phenomena in $\Lambda(1405)$ cross section(s) and line shapes demonstrated

- First direct $JP$ measurement for $\Lambda(1405)$: $\frac{1}{2}^-$

- First look at $\Lambda(1405)$ electroproduction: supports a possible two-bump / pole structure

- First $K^{*+}Y$ cross sections shown
QUESTIONS

• Listen carefully
• Think for a short time
• Answer only the question asked
  - ask for clarification if needed
• Give a short answer
• Admit when you don’t know something, but don’t sell yourself short
• Anticipate questions; try to have back-up slides
  - know how to use slide sorter
"Thank You"
"Questions"
Back-up Slides
Collaborators and Funders

• The summary should be last thing audience sees
• Do not put any other slide up after summary
• Leave final summary slide up when you finish
Summary

• You have succeeded if the audience learns

• Keep the mechanics simple

• Make sure your computer & projector work in advance

• Well chosen material, clearly presented on slides
  - format simple & repetitive to focus on message

• Know your audience

• Aim only at a few points
  - only present material that teaches those points
MPL “Short” Talks

• Start next Tuesday
• 7 minute talk on your experiment
• You’ll be scheduled by our T.A. to speak twice this semester – to your classmates
• One session per week, during lab time
• 7 minutes → ~7 slides
  – Teach your colleagues something!
• Required but not graded (practice for graded “Long” talk)
Backup Slides
PSYCHOLOGY OF SUCCESSFUL PRESENTATIONS KNOWN

• Use knowledge of how brain receives and processes information

• Optimize the chances of audience learning from your talk

• E.g.,
  - How many points should be on each slide
  - How to use highlighting and moving items into background
  - How to use formatting to enhance memory of points

• Very good source: