

Effective Posters— *Presenting your Results Clearly and Persuasively*



Courtesy Carlos A. Alvarez Zarikian

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An effective poster must

Attract and engage the audience—

- prominent title
- visually interesting figures (lots)
- clean, uncluttered appearance

Highlight key points so they are *immediately* recognizable

Be arranged logically so a viewer quickly understands the “story”

Contain all elements of a good research paper—motivation, methods, results, discussion, conclusions, acknowledgments

Distill your message

What one idea do you want your audience to remember when they walk away from your poster?



How can you best represent that one idea?

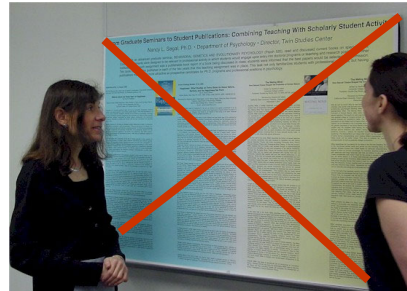
In pictures?

In plots?

In words?

**Tip: Note that “words” is the last item on the list!
(and should take up the least space on your poster)**

Use the visual elements of the poster to tell the story



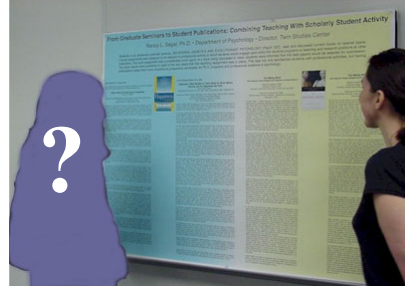
Use the visual elements of the poster to tell the story

Engage the audience

Emphasize main points

Illustrate apparatus,
methods, and results

Summarize numerical data to show trends
or reveal relationships



Tip: People remember pictures, not words

At least half your “story” should be told in pictures

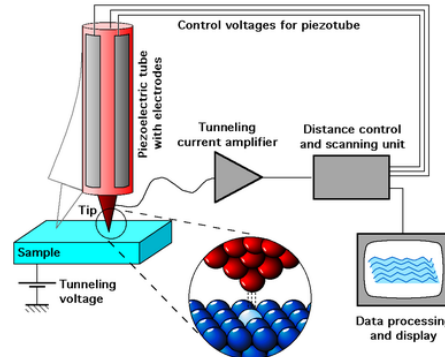
No graphic should be smaller than
5 in × 7 in (13 cm × 15 cm), and most
should be larger

Crop and enlarge photos and simplify
drawings to focus attention on important
details

Scan photos at 300 dpi

Provide a brief caption for every graphic;
tell people what to look for

Don't use pointless graphics

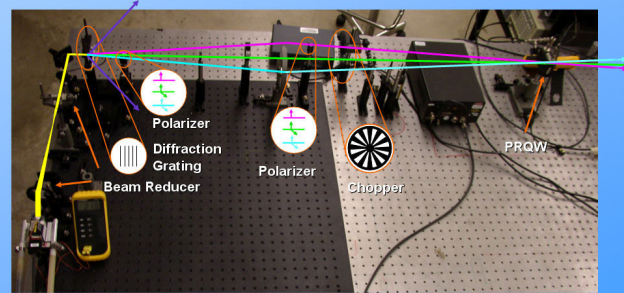


http://en.wikipedia.org/wiki/Scanning_tunneling_microscope

Your project used a scanning tunneling microscope to characterize your thin-film superconducting samples. Which is a better image for your poster?

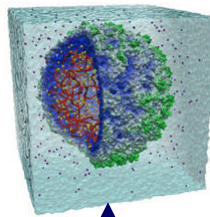
This excellent graphic shows the apparatus *and* the process

Experimental Apparatus



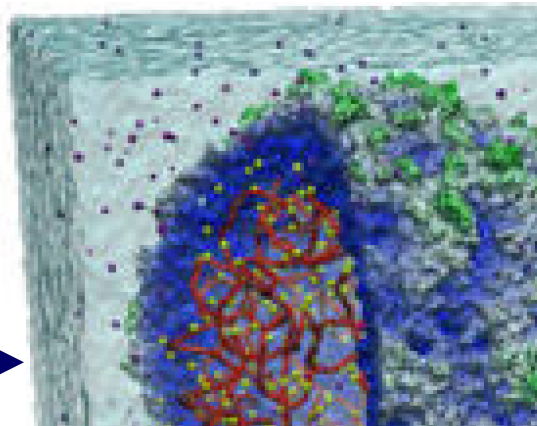
Tip: Show pictures of equipment only if they are related to an important idea that you want to convey

Avoid using graphics taken from the Internet; they're too low-res to print acceptably



Theoretical and Computational Biophysics Group
University of Illinois at Urbana-Champaign

Looks fine on your monitor; looks awful blown up to poster size and printed.



Make every graphic mean something; avoid “eye candy”

Improving the Cooling of Blades and Vanes in Gas Turbine Engines



To increase efficiency, gas turbine engines have to run at higher temperatures



Jet engines

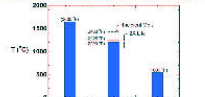


Power turbines

However, higher combustion temperatures reduce the life of the blades and vanes



Better cooling schemes can dramatically affect the life of blades and vanes in gas turbines



If a cooling scheme can decrease the temperature that a blade experiences by 20°C, the blade's life will double

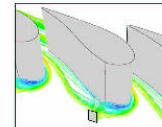
Our laboratory studies cooling schemes through experiments and computations



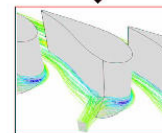
Computational Predictions

Wind Tunnel Experiments

Results from our studies are helping sponsors design better gas turbine engines



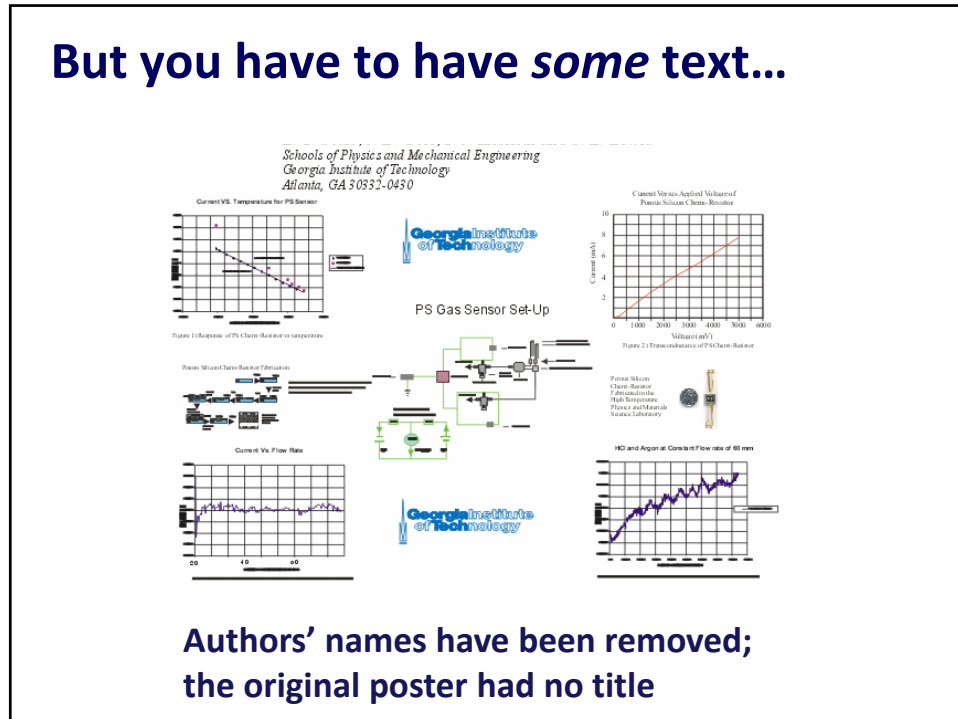
Without Fillet: Unwanted Vortices



With Fillet: Vortices Reduced

In summary, we are improving the cooling of blades and vanes in gas turbine engines

But you have to have some text...



Use easy-to-read fonts

Sans-serif fonts usually print well and are easier to read from a distance than serif fonts

fancy fonts are harder to read

DON'T USE ALL CAPS, EVEN IN THE TITLE
—much harder to read (and proofread!)

Title—120 pt

Section headings—60 pt

Figure captions—48 pt

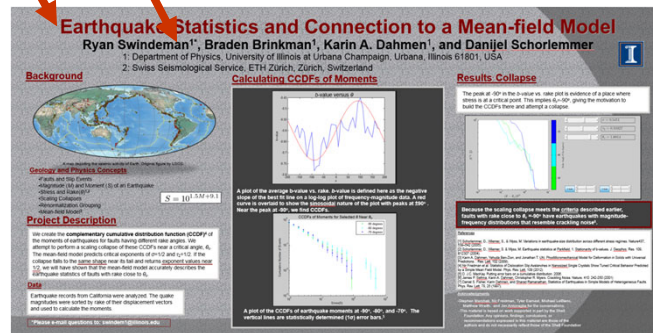
Text—36 pt

Tip: Scale the font with the size of the poster

Every poster must have a “headline” (title) and a “byline” (authors)

Title—<10 words

Your name and affiliation—Ask your adviser
NOW about co-authors



Tip: If it's important, make it BIG

Present text in lists rather than paragraphs

Figures promote audience interest, provide supporting evidence, help explain complex ideas and relationships quickly, and give the viewer something to remember

Use figures to:

- promote interest
- provide supporting evidence
- explain complex ideas quickly
- show relationships
- give the viewer something to remember

Tip: Lists are easier to process quickly and are easier to remember

Include an “abstract” only if your poster is going to be unattended for lengthy periods*

If you’re standing there explaining the work, nobody’s going to read an abstract anyway

Use the space for something more compelling and visually interesting

If you *must* include an abstract, keep it very brief (<50 words)

***or if your adviser tells you to...**

Remember that people will be looking at your poster while standing, not sitting

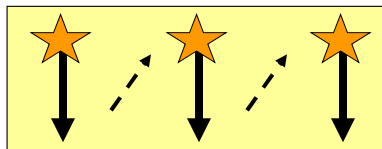


Tip: Don’t put important points in tiny print at the bottom

Most viewers will start at the upper left corner of the poster and read down and across

Break up your story into columns (think “newspaper”)

Put important points at the top of each column



Tip: Keep lines of text <20 words long—people’s eyes don’t easily track strings of text longer than that, even at 30 pt

How is the viewer going to navigate through this poster?



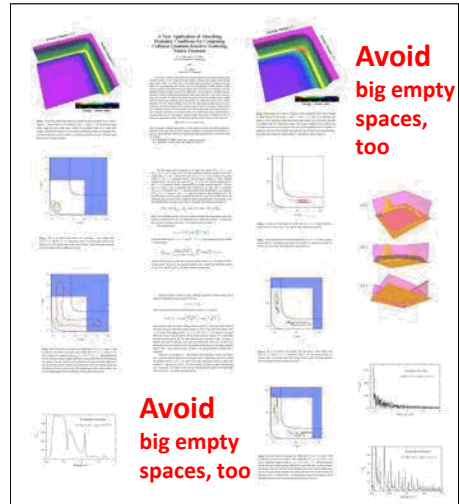
The poster is titled "Prospects for ϕ meson production at ALICE" and is divided into several sections. At the top, it says "ALICE Collaboration" and "Heavy Ion Physics". The main text discusses the production of ϕ mesons in heavy-ion collisions, mentioning the STAR and PHENIX experiments. It includes a diagram of a heavy-ion collision and a plot of ϕ meson production yield. The poster also lists the ALICE Collaboration members and the ALICE detector components.

Use headings to guide the viewer through the poster

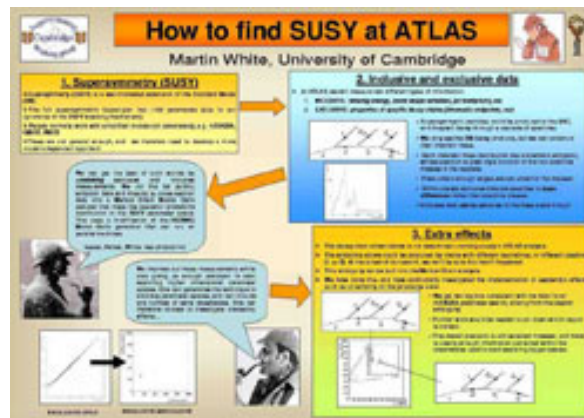
Make your key points immediately recognizable

Use headings to help viewers locate what interests them

- Motivation
- Methods
- Results
- Conclusions



If navigation is not *immediately* obvious, number the elements or use arrows to guide the viewer through the poster.



The center of the poster should feature the methods and results

Problem statement, motivation,
objectives

Methods

Results

Applications or future work

Sources of additional information

Acknowledgments

Tip: Visually represent the relative importance of text elements

Position your important points strategically

Production of Δ Particles from Σ^* Decays at HERMES
Cynthia Chiang, University of Illinois at Urbana-Champaign

Background

- Examine spin transfer through fragmentation process
- Study spin structure of Δ particles produced in deep-inelastic scattering (DIS) events

The HERMES experiment

- Major physics experiment for studying spin structure of particles
- Located at the Deutscher Elektronen Synchrotron (DESY) in Hamburg, Germany
- Longitudinally polarized 27.5 GeV positron beam
- Gas target (operated by the various host-institution groups)

The problem

SIGMA CONTAMINATION!

- Contribution between theory and background?
- Three values models
- Three conventional models that attempt to model σ -dependence or σ dependence of σ
- Possible problem: σ can also be produced in decay product of another Particle, such as Σ^*
- Can σ contribute to the discrepancy between theory and experiment?

The hunt for Σ^*

- Step 1: Identify events in data containing Σ^* candidates
- Step 2: Develop methods for identifying Σ^* by examining Particle Correlations
- Step 3: Find Σ^* in data (events containing Σ^* candidates) from Particle Correlation
- Step 4: Use Monte Carlo to determine fraction of Σ^* particles produced in decay
- Step 5: Use results to develop model for the longitudinal spin transfer process

Results

- Multiple identified Σ^* candidates in the data
- Can Σ^* particles appear in events with Δ particles? Can Σ^* particles appear in events with Δ particles and Σ^* particles?
- Can we use Monte Carlo to model σ in analysis code or other Monte Carlo software?

Future plans

- Identify and Monte Carlo backgrounds
- Contribution to section 2, but also from 2: develop code for identifying Σ^* candidates in the data
- Find fraction of Δ particle production σ \rightarrow decay products
- After 2, 2 contribution is determined, it will be possible to correctly interpret spin transfer data

Courtesy H. Chiang

Tip: Position important information above the midline and in the center

Choose colors carefully

Colors affect how easily
your poster can be read

Use a high contrast between
background and text

“Warm” colors are more
visible, but don’t
overpower with orange
(even Illini orange)

Avoid using red/green
or red/blue

**Tip: Gradient backgrounds that look great
on your monitor may not print properly**

Energy and Water Savings Design for WOODLAWN TOWERS III
Design Team: Amber Leuter, Michael Trout & Emily Winkler, Advisor: Dr. Warren Strain

Introduction
To provide energy and water savings designed to an aging infrastructure building in Chicago, Ill.

Methodology
Energy Star tool was completed to determine whether the high rise is a typical unit with due to needs.

Summary
A survey was distributed to the residents to evaluate their energy and water-saving measures were already in place.

Alternatives

- Solar Power
- Geothermal Power
- Efficient Windows
- Clean Water Heat Exchanger
- Efficient Toilet/Flood Dams
- Efficient Showerheads
- Energy Efficient Server
- Efficient Lighting

Financial Summary

Measure	Cost/Unit	Payback Period	Energy
Double Glazed Argon Filled Windows	\$12.00	17.38	\$12.00
Insulation on Exterior Ducts	\$1.00	1.00	\$1.00
Low Flow Showerheads, Efficient Toilet/Flood Dams	\$1.00	1.00	\$1.00
Clean Water Heat Exchanger	\$1.00	1.00	\$1.00
Efficient Windows	\$1.00	1.00	\$1.00
Energy Efficient Server	\$1.00	1.00	\$1.00
Efficient Lighting	\$1.00	1.00	\$1.00
Total	\$13.00	13.38	\$13.00

Assuming 100% Participation and replacement of the listed savings would be approximately \$13,000.00

School of Engineering | Special thanks to Blair Whelan and the Board of Directors of Woodlawn Towers III | UNIVERSITY OF ILLINOIS

Use color to highlight, separate, or associate information visually

Wearable Computing

Problem Statement
Design a basic wearable computer that can be fully integrated with wearable IoT devices.

Applications

- Medical
- Military
- Commercial
- Industrial
- Agricultural reality

Main ATX Board Specs

- 650 Watt VESA DDM Processor
- 16GB 80 pin
- 20000 RPM Hard Drive
- 240GB SSD
- 10000 RPM SATA 6Gbps
- 10000 RPM SATA 6Gbps
- 10000 RPM SATA 6Gbps

Input/Output Devices

- Customized I/O devices for various components
- 10000 RPM SATA 6Gbps
- 10000 RPM SATA 6Gbps
- 10000 RPM SATA 6Gbps

Design Specifications

Specification	Value
Processor	Intel Core i7-7700K
Memory	16GB DDR4
Storage	240GB SSD
Power Supply	650W
Case	Mid Tower
OS	Windows 10

Conclusions

- Computer system optimized for specific uses
- Various I/O devices available on both end
- Replicable system built above for engineering, partners with additional capabilities
- Large trade off between battery weight, battery life, and cost
- Trade off and weight can be easily adjusted depending on desired application and I/O devices

Using a Windbreak Habitat Model Across Broad Landscapes: The Effect of Local Landscape Composition and Geographic Location

1. Windbreaks in Habitat
Windbreaks are a key component of habitat structure and can significantly influence the microclimate and resource availability for many species.

2. Revised Evaluation of Windbreaks
This research aims to evaluate the effectiveness of windbreaks in different landscape contexts and geographic locations.

3. Bird Species Richness Index
The Bird Species Richness Index (BSRI) is a measure of the number of bird species present in a given area.

4. Validation of the Model
The model was validated using data from a large-scale field study across multiple geographic locations.

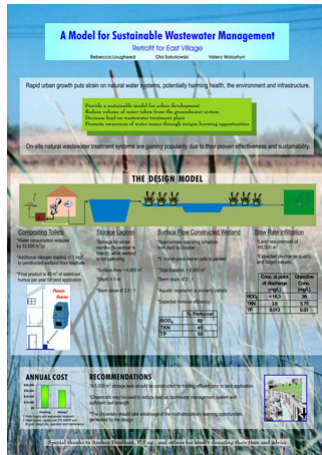
5. Local Landscape-Scale Effects
Local landscape composition, including the presence of windbreaks, significantly influences the BSRI.

6. Future of the Model
The model can be used to predict the effects of landscape changes on bird species richness.

7. Conclusions
Windbreaks are a key component of habitat structure and can significantly influence the microclimate and resource availability for many species.

Tip: People expect color to mean something; don’t use color randomly

Choose neutral backgrounds with high-contrast text and images



Leave adequate “white space”

Effective posters look uncluttered

Use white space to isolate and emphasize important details

Leave at least 1.5 in (4 cm) of white space between columns

Balance elements on the page

Tip: Leave at least 0.5-in (1.25-cm) margins on all sides of your poster; no plotter prints to the very edge of the paper

“White space” doesn’t have to be white

Radiative Transfer in Turbulent Interstellar Clouds
Charles Hansen: University of Illinois at Urbana Champaign

Motivation	Monte Carlo Radiative Transfer	Optical Depth and Turbulence	Results
<p>Radiative Transfer</p> <p>Goal: To study the radiative transfer properties of turbulent interstellar clouds.</p> <p>The Clouds:</p> <ul style="list-style-type: none"> High density, molecular Typical sizes of many parsecs Mass numbers easily over 1000 <p>The Radiative Transfer:</p> <ul style="list-style-type: none"> Non-parallel, computationally expensive Uniform density assumed previously <p>Astrophysical Chemistry</p> <p>Light levels within a cloud can significantly alter the ionization and temperature of a cloud and give rise to interesting chemical compositions.</p> <p>Ambipolar Diffusion</p> <ul style="list-style-type: none"> Strong magnetic fields cannot collapse Magnetic field is not dissipative Dissipative forces + ambipolar diffusion Ambipolar diffusion is controlled by ionization fraction 	<p>Monte Carlo Method</p> <ul style="list-style-type: none"> Many photons integrated through a cloud Directions chosen “randomly” The primary equation being solved: $\frac{dI}{ds} = -I(\mu)(\text{Absorption} + \text{Scattering})$ <ul style="list-style-type: none"> Integration produces an incoming flux and outgoing flux. The fluxes yield an effective optical depth, τ <p style="text-align: center;">Simulated Clouds</p> <ul style="list-style-type: none"> Simulated with ZEUS algorithm Isothermal Compressible Ideal Gas Magnetohydrodynamic Swept over much number and magnetic field strength 	<p>Optical Depth and Turbulence</p> <ul style="list-style-type: none"> Increased turbulence → Decreased τ Light goes through “light tubes” of low density More turbulence → More light tubes τ can go as low as 50% of its smooth density value <p>Esther Wood</p> <p>The radiation observations have been used. SHE is still performing more extensive quantitative analysis.</p>	<p>Results</p> <ul style="list-style-type: none"> Light tubes align with magnetic fields Clouds more transparent in direction of light tubes ~10% difference with 00° rotation <p>Anisotropy</p> <p>Alignment of Light Tubes with Magnetic Fields</p> <p>Highly localized density in a cloud with localized magnetic field</p> <p>View of a cloud that features magnetic field aligned light tubes</p> <p>Adriano de Maziade</p> <p>The physics is simulated by CLOUDS. Compare with existing ROSAT giant AOT 00-00091</p>

Courtesy Charles Hansen

You must have an “acknowledgments” section on your poster

First, get it spelled correctly—no *e* following the *g* in the US English spelling of *acknowledgment*

(Don’t believe me?—look at the acknowledgment page of any book published by a US publisher)

British English spells it with the “e,” but we colonials have our own rules

**Some wimpy dictionaries may accord
“acknowledgement” alternative status,
but we have higher standards in physics**

Acknowledge research contributions by people other than the authors

**Persons who gave scientific guidance,
participated in discussions, or shared
unpublished results, data, or samples**

Persons who provided facilities or equipment

**Assistants or students who helped do the
work**

Technicians at user facilities or labs

**Tip: Make it a simple statement of thanks,
not a testimonial or dedication**

Acknowledge by name only

**Do not use titles, honorifics, positions, or
awards**

Paul G. Kwiat

NOT

**Professor Paul G. Kwiat,
Bardeen Chair in Physics**

Anthony J. Leggett

NOT

Sir Dr. A.J. Leggett, Nobel Laureate

Always acknowledge financial support of the research—always

Give the name of the funding agency and grant
or contract number

“This material is based upon work supported by
the National Science Foundation under Grant
No. ____.”

On posters, the following disclaimer must be
included for NSF-funded research:

“Any opinions, findings, and conclusions or
recommendations expressed in this material are
those of the authors and do not necessarily reflect
the views of the National Science Foundation.”

What about logos?

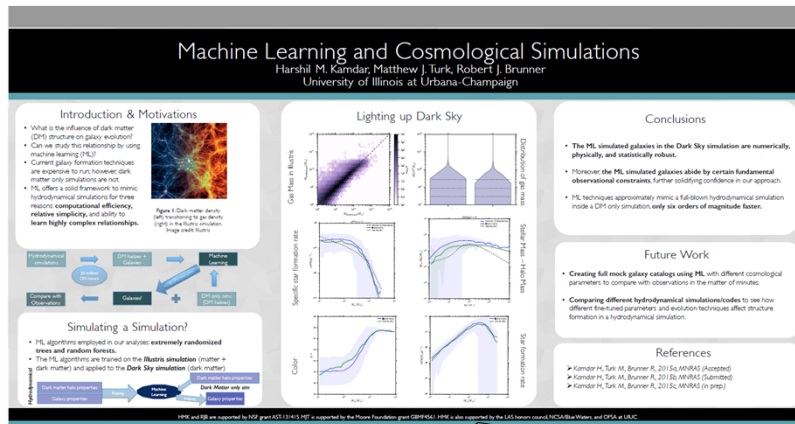
Federal funding agencies may allow you to use
their logos, but obtain a high-resolution image
and follow their guidelines

The University has explicit rules about the use
of the I-mark

Companies are aggressive about protecting their
brands and trademarks; just because you can
grab a logo off a website does *not* mean you
can use it with impunity



Where to put the acknowledgments?



Prepare a “stump speech” to introduce your poster

Should be 1–2 min.

Briefly state

1. What you studied and why it’s important
2. What methods you used
3. What your principal results are
4. What you think they mean
5. What you’re going to do next

Prepare two versions—one for experts and one for novices

Be prepared to be interrupted with questions; rehearse possible answers

Prepare two versions of your stump speech

Non-experts:

- Emphasize the “big picture”
- Explain what’s new and why it’s important
- Use simple words—no acronyms or jargon
- Don’t get bogged down in technical details

Experts:

- More technical language
- More detailed explanations of methods and results
- More math

Rehearse both versions



Out loud

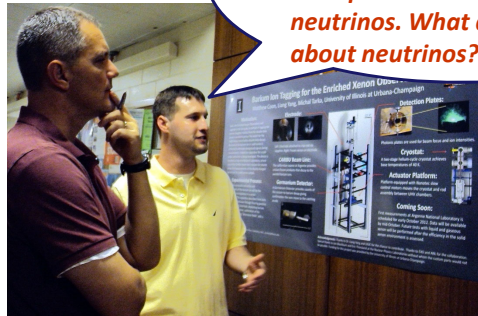
In front of real people

Okay to write it out first, but practice until you can deliver your lines without notes

How do you know which version to give?

ASK!

Hi, I'm Matt. Thanks for stopping by. I'm working on an experiment to detect neutrinos. What do you know about neutrinos?



Be prepared to be interrupted with questions during your speech

Respond to a question as soon as it is asked, don't just keep rattling off your speech

That's a great question. We're interested in them because they are a candidate for dark matter.



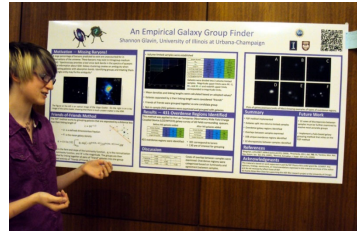
Rules for answering questions:

Always be respectful

If you don't understand the question, ask for clarification

If the question is off-topic, redirect

Don't ever argue with a questioner—you'll just look bad



PHYS 499 Posters, October 2012; Shannon Glavin

If you don't know the answer, just say so*

***Make a note of it to ask your adviser!**

***Ask for the person's email address and say you'll find out the answer and send it to him or her.**

Find out *before* your session . . .

The location and time by which your poster is to be displayed

What kind of surface your poster will be mounted on

Whether you need to provide your own tape, thumbtacks, Velcro strips...

Whether other needed equipment will be provided (electrical outlet, table, easel)

Tip: Don't expect the meeting organizers to supply you with anything other than space

Tips for successfully presenting your poster:

Arrive early (early birds usually get the desirable locations)



Bring your own “poster hanging” emergency kit

Have your “stump speech” prepared to explain your work to visitors

- Give the big picture
- Explain why the work is important
- Have two versions—one for experts and one for non-experts

Greet each visitor with a smile; ask questions to elicit interest and level of understanding

Be prepared to mount your poster on any surface

Your poster-hanging toolkit should include:

- Push pins or thumbtacks
- Straight pins or drawing pins
- Plastic mounting putty
- Velcro® strips and glue
- Clear PCV tape or masking tape
- Scissors



Have a permanent marker the color of your text for emergency typo corrections

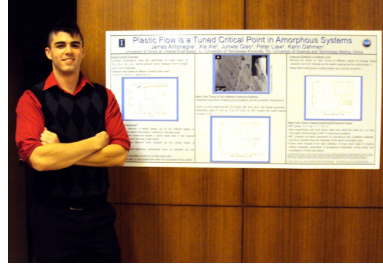
Have a small notebook and pen handy for notes

Convey your enthusiasm for your research project

Greet people as they walk up to your poster

By your stance and expression, invite them to ask questions

Have your business cards, copies of your paper, or other handouts ready



PHYS 499 Posters, October 2012; James Antonaglia

Tip: Open your hands, lean forward, and smile

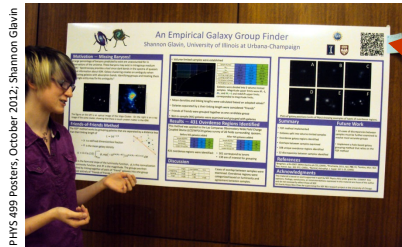
Have hand-outs available

A miniature version of your poster

An extended abstract or a summary

Reprints or preprints

Include your complete contact information



PHYS 499 Posters, October 2012; Shannon Glavin

Tip: use a QR code to link to the group's web site or a copy of the paper

Tip: an 11-in × 17-in sheet of paper, folded in half, gives you four pages for additional information about your work in one handout

Some advice from the experts:

**Never ever put
anything on your
poster that you do
not thoroughly
understand**



**That figure you got from somebody else
and added at the last minute...**



...will be all the audience asks questions about

Some final advice:

Eat breakfast (or lunch) before your session

**Take a bottle of water with you—it's hard to
talk when your mouth feels like a desert**

Wear comfortable shoes

**Wear clothes that are loose enough you can
point to things on your poster**

**Take pride in what you've learned and done—
don't apologize**

Relax and have fun



cm Elliot@illinois.edu

<http://physics.illinois.edu/people/Celia/>