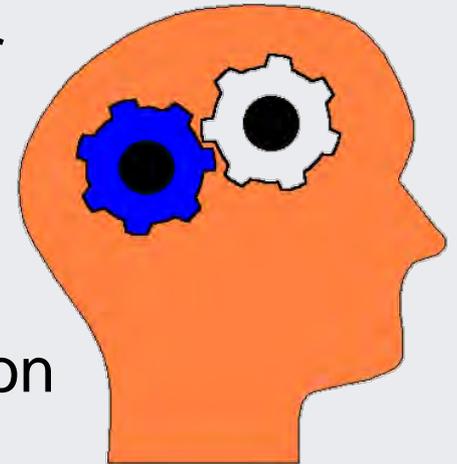




## Purpose of a Poster

- To clearly communicate information and ideas
- To describe an area of research, health research center or core, research theme, or opportunity for future health research collaboration with faculty in the College
- To stimulate interest and discussion among Health Scholar Showcase participants



# A Great Poster Is...

## Readable

- Easy flow of ideas from one item to the next
- Avoid grammatical errors, complex or passive sentence structure, and misspellings which make a poster "hard to read"



# A Great Poster Is...

## Legible

- If a text is legible, it can be “deciphered”
- Common errors include:
  - Use of fonts that are too small to be read from 4-6 feet away, the typical distance for reading a poster
  - Poor text color selection

Size:	Arial:	Times New Roman:
1	Font	Font
2	Font	Font
3	Font	Font
4	Font	Font
5	Font	Font
6	Font	Font
7	Font	Font



# A Great Poster Is...

## Well Organized

- Spatial organization makes the difference between reaching 95% rather than just 5% of your audience
- Time spent trying to understand the content or data is time taken away from thinking about the main messages you seek to convey



# A Great Poster Is...

## and Succinct

- Studies show that you have only 10 seconds to grab and retain your audience's attention
- Make sure the title is prominent and clear
- Keep the amount of text used throughout your poster to a minimum
- Do not attempt to include too many details in your poster. Stick to the big ideas.

# Making a Poster – 2 easy steps!

## Designing the Poster Elements

- Most posters are made using some kind of computer software
- We recommend using Microsoft PowerPoint



## Printing the Poster

- Several local printers can print your poster. Health Scholar Showcase posters should use a 36 x 48 inch trifold template. Contact us if you have questions.

# Give Yourself Enough Time

## Time

- It takes time to make a great poster
- Allow yourself 2 - 3 days to design and create your poster
- Last bits of data you rush around to get at the last moment will go completely unnoticed if your poster is messy and disorganized

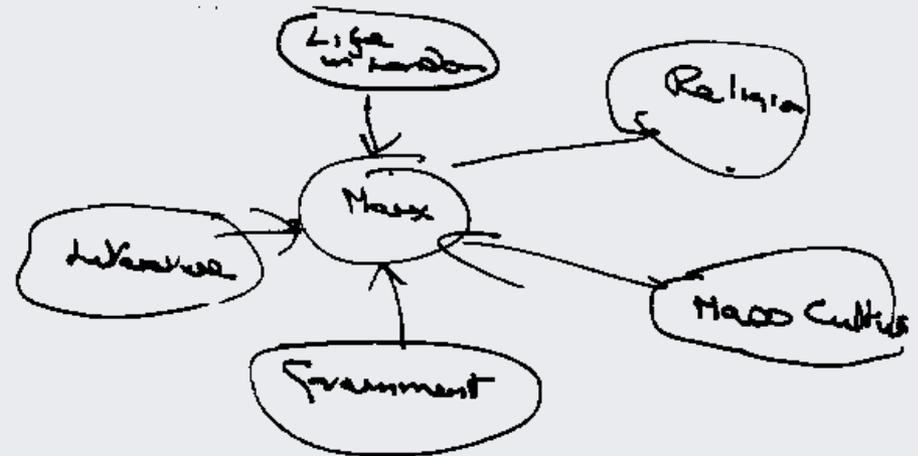


# Getting Started



## What is the Main Message?

- Keep it short and sweet. Avoid jargon and acronyms
- Your poster should cover the key points of
- your topic or theme
- Make your poster as self-explanatory as possible
- **Do not attempt to include too many details!**

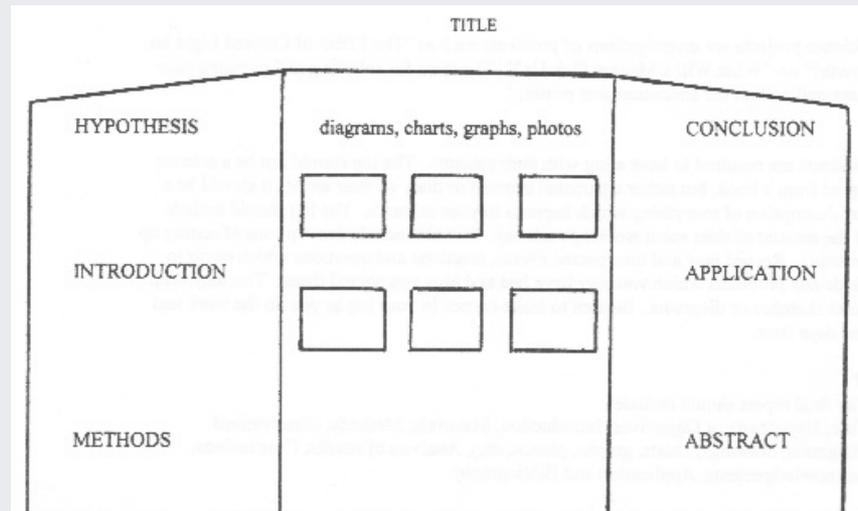


## Capture your Audience

- Minimize use of text. Maximize use of images, graphs, and charts to tell your story
- Main points must come through clearly with very little effort from the viewer
- If a detailed explanation is required, prepare a handout for viewers. Include detailed contact information or action steps for viewers to follow up with you.
- What one or two things do you want the person viewing your poster to know or learn from the content? Including too many main ideas creates clutter and confusion.

## Arrange your Content Elements

- Before creating the final poster layout, take pieces of paper that are about the size of each element and see if you can actually make everything fit in the three columns of your trifold 36 x 48 poster



## ELIMINATE all Extraneous Material

- The average poster gazer spends less than 15 seconds deciding whether or not to stop and read the content of your poster.
- Present data only if it supports your central message
- When in doubt, edit out – crowded cluttered posters are rarely read and seldom effective. Simple images and graphics are more likely to gain attention

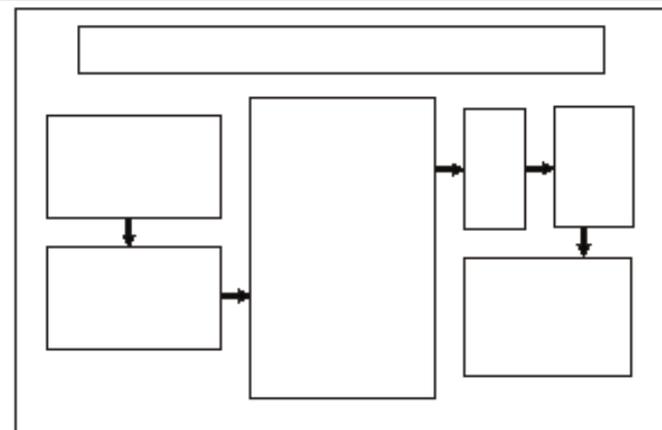
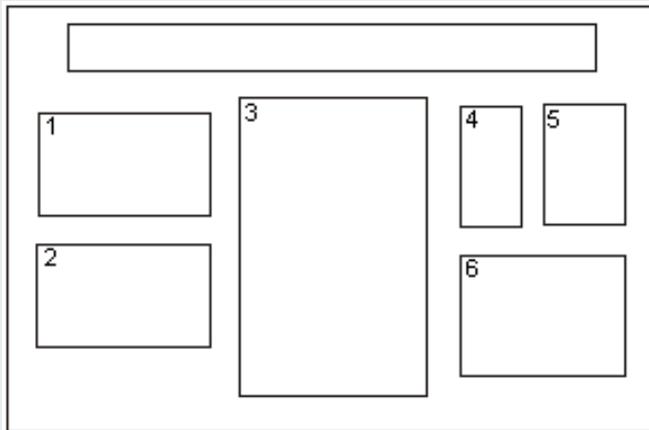




# Poster Layout

## Arranging Poster Elements and Text

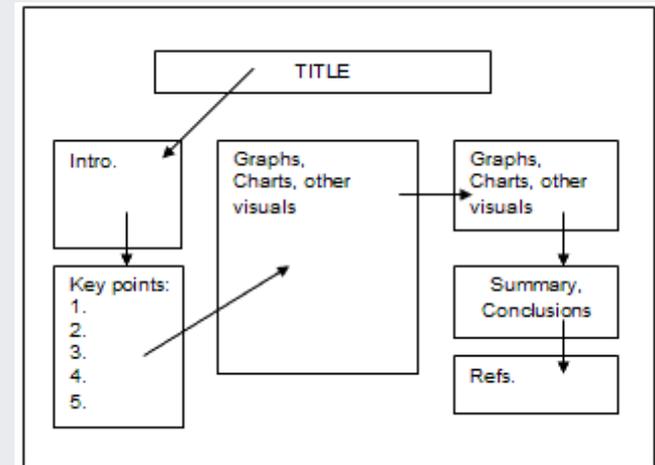
- People approach new information in a known spatial sequence: we track vertically from center to top to bottom, and horizontally from left to right



# Poster Layout

## Arranging Poster Elements and Text

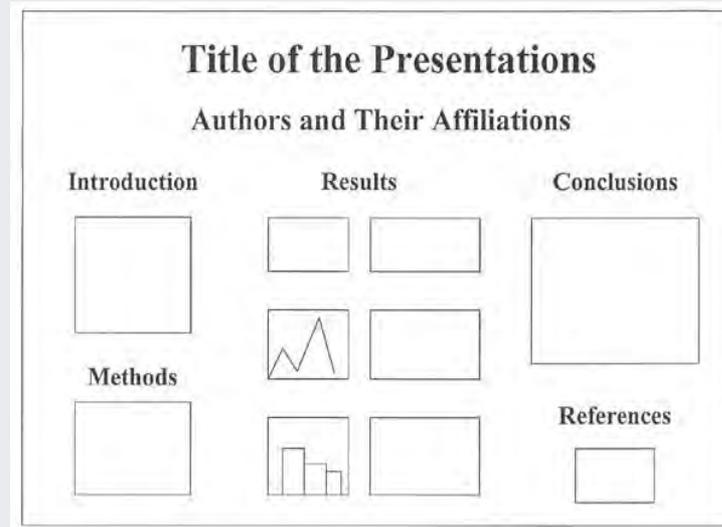
- Sample posters may be viewed at <http://facultycommons.txstate.edu/groups/translational-health-research-initiative/>
- Put the most important message in the center top position followed by the top left, and the bottom right corner
- In the center top position should be the title and your name so they will be seen in the first 5 seconds a person looks at the poster



# Poster Layout

## Arranging Poster Elements and Text

- A poster layout in *columns* is most common.
- Arrange the contents into 3 or 4 columns to facilitate the 36 x 48 trifold format
- Organize the material into sections (e.g., Overview, Activities, Opportunities, Conclusions, etc.)
- Use blank space to highlight or offset information



# Poster Layout

## Space is Important

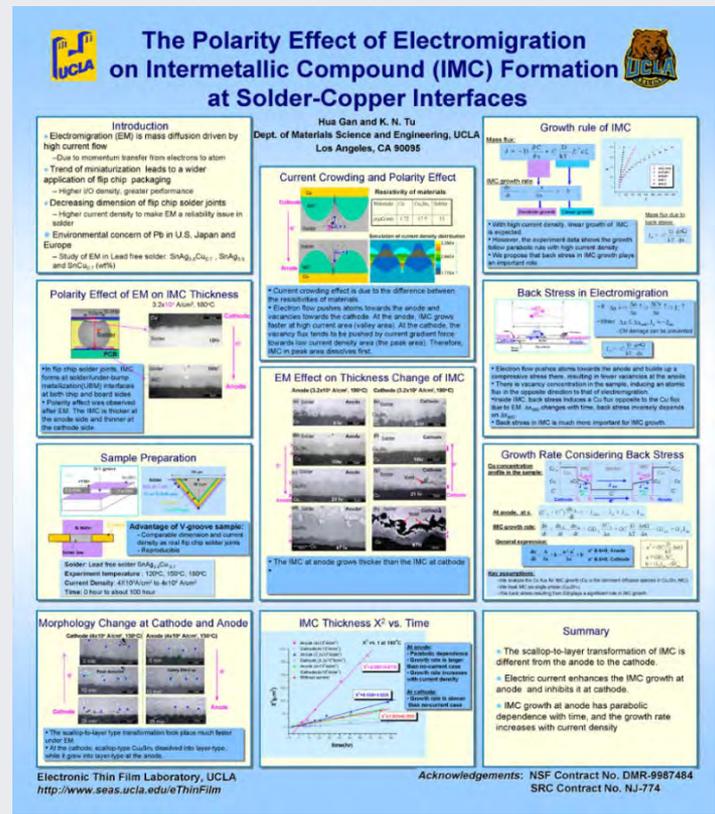
- Without space, your reader has no visual pauses to think
- Allow space between sections and around images
- Leave at least a 1/2 inch margin around all edges of your poster, and leave at least 1/2 inch for the gutters in the trifold



# Poster Layout

## Size is Important

- Size of poster elements or the fonts in each element can serve to emphasize the main points
- Making your subheadings in all capitals and two font sizes larger than the rest of the text on the same panel will draw the reader's eye first, and so be emphasized



**The Polarity Effect of Electromigration on Intermetallic Compound (IMC) Formation at Solder-Copper Interfaces**

Hua Gan and K. N. Tu  
Dept. of Materials Science and Engineering, UCLA  
Los Angeles, CA 90095

**Introduction**

- Electromigration (EM) is mass diffusion driven by high current flow
- Due to momentum transfer from electrons to atom
- Trend of miniaturization leads to a wider application of flip chip packaging
- Higher I/O density, greater performance
- Decreasing dimension of flip chip solder joints
  - Higher current density to make EM a reliability issue in solder
- Environmental concern of Pb in U.S. Japan and Europe
  - Study of EM in Lead free solder: SnAg<sub>3</sub>, Cu<sub>63</sub>, SnAg<sub>3</sub>, and SnCu<sub>3</sub> (wt%)

**Growth rule of IMC**

Mass flux:  $J = -D \nabla C + \frac{1}{Z} \frac{D}{F} \nabla \phi$

IMC growth rate:  $\frac{dL}{dt} = \frac{D}{L} \left( \frac{1}{Z} \frac{\nabla \phi}{F} - \nabla C \right)$

High current density, shear growth of IMC is expected. However, the experimental data shows the growth follows parabolic rate with high current density. We propose that back stress in IMC growth plays an important role.

**Current Crowding and Polarity Effect**

Resistivity of materials

Electron flow pushes atoms towards the anode and vacancies towards the cathode. At the anode, IMC grows faster at high current and higher area. At the cathode, the vacancy flux tends to be pushed by current gradient force towards low current density area (the peak area). Therefore, IMC in peak area decreases first.

**Polarity Effect of EM on IMC Thickness**

3.2x10<sup>4</sup> A/cm<sup>2</sup>, 100°C

No flip chip solder joints, IMC forms at solder/under bump metallization (UBM) interfaces at both chip and board sides. Polarity effect was observed after EM. The IMC is thicker at the anode side and thinner at the cathode side.

**Back Stress in Electromigration**

Electron flow pushes atoms towards the anode and builds up a compressive stress there, resulting in fewer vacancies at the anode. There is vacancy concentration in the sample, inducing an atomic flux in the opposite direction to that of electromigration. Hence IMC back stress induces a Cu flux opposite to the Cu flux due to EM.  $A_{back}$  changes with time, back stress inversely depends on time.

Back stress in IMC is much more important for IMC growth.

**Sample Preparation**

Advantage of V-groove sample:
 

- Comparable dimension and current density on each flip chip solder joints
- Reproducible

Solder: Lead free solder (SnAg<sub>3</sub>, Cu<sub>63</sub>)  
 Experiment temperature: 120°C, 150°C, 180°C  
 Current Density: 42.10<sup>4</sup> A/cm<sup>2</sup> to 8.10<sup>4</sup> A/cm<sup>2</sup>  
 Time: 24 hour to about 100 hour

**EM Effect on Thickness Change of IMC**

Anode (3.2x10<sup>4</sup> A/cm<sup>2</sup>, 100°C) Cathode (3.2x10<sup>4</sup> A/cm<sup>2</sup>, 100°C)

The IMC at anode grows thicker than the IMC at cathode.

**Growth Rate Considering Back Stress**

At anode, etc.,  $\frac{dL}{dt} = \frac{D}{L} \left( \frac{1}{Z} \frac{\nabla \phi}{F} - \nabla C - \frac{A_{back}}{L} \right)$

At cathode, etc.,  $\frac{dL}{dt} = \frac{D}{L} \left( \frac{1}{Z} \frac{\nabla \phi}{F} - \nabla C + \frac{A_{back}}{L} \right)$

General equation:  $\frac{dL}{dt} = \frac{D}{L} \left( \frac{1}{Z} \frac{\nabla \phi}{F} - \nabla C \pm \frac{A_{back}}{L} \right)$

**Morphology Change at Cathode and Anode**

Cathode (6.10<sup>4</sup> A/cm<sup>2</sup>, 100°C) Anode (6.10<sup>4</sup> A/cm<sup>2</sup>, 100°C)

The scallop-to-layer type transformation took place much faster under EM.

At the cathode, scallop-type Cu<sub>63</sub> dissolved into layer type, while it grew into layer type at the anode.

**IMC Thickness X<sup>2</sup> vs. Time**

At anode: Parabolic transformation depends on time. Back stress slows down the growth rate. At cathode: Parabolic rate is slower than untransformed case.

**Summary**

- The scallop-to-layer transformation of IMC is different from the anode to the cathode.
- Electric current enhances the IMC growth at anode and inhibits it at cathode.
- IMC growth at anode has parabolic dependence with time, and the growth rate increases with current density.

Electronic Thin Film Laboratory, UCLA  
<http://www.seas.ucla.edu/ThinFilm>

Acknowledgements: NSF Contract No. DMR-9987484  
 SRC Contract No. NJ-774

# Font Choice

## Font

- Choose a basic font whose "e's" and "a's" stay open at all sizes and that is supported by your printer
  - Arial, Calibri, Helvetica, and Tahoma are good choices
- Avoid use of multiple fonts which can be distracting

EDDY'S BONES PLANK Cracked  
 CREEPY Blur CHOCOLATE  
 COFFEE SACK FLOWER POWER  
 Cathedral GAUSS RUBBER STAMP  
 celtic SPIKE Beau Amaze  
 Borghs Cracked Southwestern  
 ELIZABETH Wright Bart BIG NIB  
 FANZEE Oak Ridge NEW YORK  
 Lauren DECO Parisian Crane  
 FATSO DEVON NATIVE  
 Catchup Expose Heidleberg  
 IRONWORK ASIA TEMPLETT  
 Cocoa Billboard DAVIS  
 GREMLIN Brando EXPTEL

FATSO DEVON NATIVE Cathedral GAUSS RUBBER STAMP  
 Catchup Expose Heidleberg celtic SPIKE Beau Amaze  
 IRONWORK ASIA TEMPLETT Borghs Cracked Southwestern  
 ELIZABETH Wright Bart BIG NIB

# Font Choice

## Size

- Font sizes need to be big to be effective
- You should be able to easily read it from 4-6 feet away
- Test this by viewing a portion of your poster on your computer
  - Zoom in to 100%
  - Step back from your monitor to see if you can still read it

Size:	Arial:	Times New Roman:
1	Font	Font
2	Font	Font
3	Font	Font
4	Font	Font
5	Font	Font
6	Font	Font
7	Font	Font

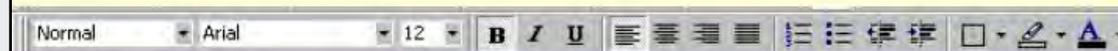
## Size

- Recommended **Minimum** Font Sizes
  - Title: 60 point bold
  - Researchers and affiliations: 48 point
  - Section headings: color of your choice, 30 point bold
  - Text: black, 24 point
  - Figure, graph and table captions: black, 20 point
  - References and acknowledgements: black, 20 point
  - Photo/image credit: black, 14 point

## Format

- DO NOT use single spacing!
- Indents set text apart and are great for short lists
- Justify text
- Use bullets to illustrate discrete points

### Formatting Toolbar



The **Formatting Toolbar** is a collection of buttons that makes it easy for you to do simple formatting that changes the appearance of your document.

# Images, Graphs, and Tables

## Images

- The same or more space on the poster should be taken up by images or graphs than by text
- A good rule of thumb is 25% text, 45% graphics 30% empty space



- Use of color in your graphics will enhance your poster
- Don't forget to include explanatory captions on your poster. Captions may be written with smaller text sizes

Figure 1. Feline DNA

# Images, Graphs, and Tables

## Images

- Photos and drawings should be of sufficient size to be visible from a distance. Plan for a poster that is 48 inches wide, with 1 inch margins and gutters between columns.
- 4" x 5" photos are a good size
- Graphics are best if at least 8" x 10"
- Place related materials (e.g. photo with accompanying text) close together, then offset it by surrounding it with blank space

# Images, Graphs, and Tables

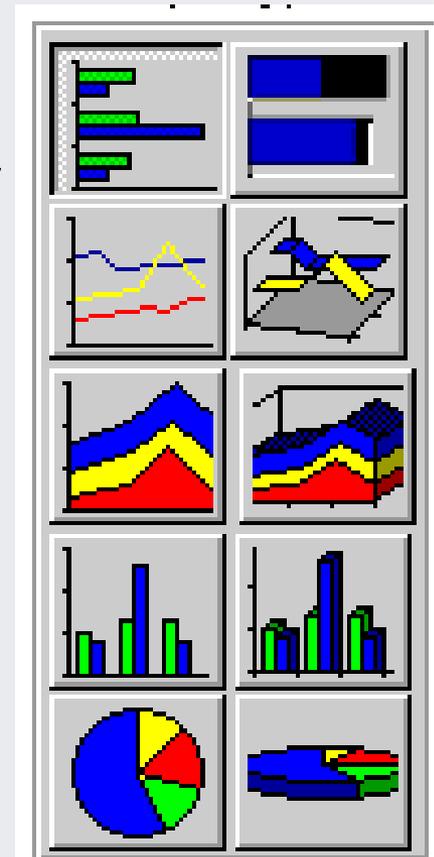
## Images

- Your images should have a resolution of at least 300dpi (dots per inch) at the size they will be ultimately printed on your poster
- Save them as either JPEG (or JPG), or TIF files
- Avoid using BMP & GIF files
- In PowerPoint go to the **Insert**, then **Picture**, then find your image
- You can adjust both the size and position of your image in PowerPoint

# Images, Graphs, and Tables

## Graphs

- When importing graphs from Excel or Lucidart, copy the graph then go to the **Home** menu, **Paste Special**, as **Picture (Enhanced Metafile)**
- Avoid complex graphs and tables with excessive numbers
- Use colors to distinguish different data groups in graphs
- Avoid using fine patterns



# Images, Graphs, and Tables

## Tables

- Use tables only if they help convey your main message(s) in a way that is more effective than a graphic.

Table 4: Installed  $R_{peak}$

TOP500 Statistics — Installed $R_{peak}$ [Gflop/s]					
	USA/Canada	Europe	Japan	others	Total
SGI	18895	6885.8	625.6	277.2	26683
IBM	9563.8	3756.3	258.1	57.0	13635
Sun	2628.1	787.1	234.4	177.0	3826.6
Hewlett-Packard	1745.5	496.5		46.1	2288.0
Fujitsu	48.4	620.8	1370.6	28.6	2068.4
NEC	256.0	248.0	842.0	64.0	1410.0
Hitachi		77.0	3200.0		3277.0
others	4244.8	137.6	125.1		4507.5
Total	37381	13009	6655.7	649.8	57696

# Add Color

## Color & Contrast

- Proper color contrast will reduce eye strain and make the poster more legible and interesting visually
- Be careful that the color does not outclass the visual impact of your data
  - Too much contrast is hard on the eyes and can distract the reader from your data
- Use color for highlighting and to make your poster more attractive

# Add Color

## Color & Contrast

- Choose a simple color scheme using no more than four total colors
- Avoid patterns or motifs
- Dark background colors sometimes look nice, but dark backgrounds may increase your poster printing costs

RED	YELLOW	BLACK	WHITE	GREEN
WHITE	WHITE	BLUE	BLACK	BLUE
WHITE	RED	BLACK	BLACK	ORANGE
ORANGE	PURPLE	BLACK	YELLOW	BLUE
PURPLE	ORANGE	GREEN	YELLOW	RED

# Save your Poster

## Saving

- Save the poster as a PowerPoint Presentation or **Adobe .pdf only!** Texas State provides the Adobe Creative Suite to all faculty and staff, so you should be able to use Adobe to create a pdf of your poster.
- Other save options (.gif, .jpg) will reduce the quality of your poster and should not be used

# Before You Print

## Final Check

- Make sure several people look over your poster before you print
  - Research Coordinators
  - Faculty
  - Your Dean
- If your reviewers are confused, it is far better to fix the content now, before it is printed or presented.
- Reduce or eliminate unnecessary content!



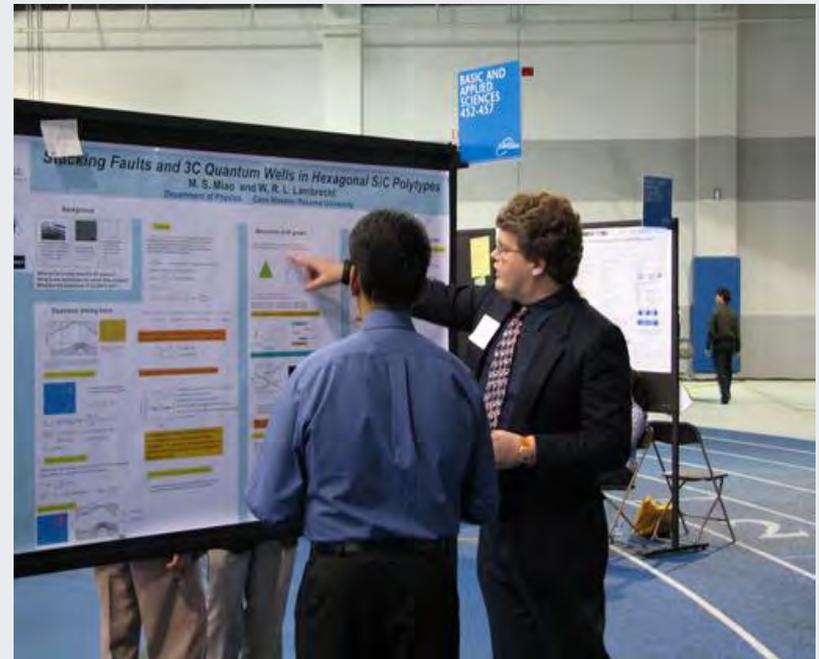
# Printing Preparation

## Test Print

- Print your poster on regular letter paper to proof read it
- Go to the **Print** option. In the pop-up window, select the **Scale to fit paper** box, and set the paper size to **letter (8.5x11in.)** and **landscape** mode
- **Do NOT** change any of the other settings!
- After printing, you can tell that the font sizes are right if you can still read the text. Be sure the two gutters for the trifold are clear.

# Presenting the Poster

- Poster presenter(s) should prepare 3-4 talking points to deliver periodically to Health Scholar Showcase participants who view your poster.
- You may decide to have more than one presenter at a time, or assign multiple presenters to work in shifts during the Health Scholar Showcase.





TEXAS STATE UNIVERSITY  
TRANSLATIONAL HEALTH RESEARCH

Creating posters for the Health Scholar Showcase provides a new opportunity to discuss shared interests and potential opportunities for future health research and funding.

**Thank you for helping create a successful  
Health Scholar Showcase!**

**Please feel free to contact us if you need further assistance.**

Melinda Villagran 245-8094 or [mv12@txstate.edu](mailto:mv12@txstate.edu)

Abbi Mott [abbi@txstate.edu](mailto:abbi@txstate.edu)

Source: Ann Holstein (2014). Successful Poster Presentations . Case Western Reserve University Library.