

# Presentations Using L<sup>A</sup>T<sub>E</sub>X

## The Beamer Class

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## Disclaimer #1

I am **NOT** an expert in L<sup>A</sup>T<sub>E</sub>X  
I am **NOT** an expert in Beamer

## Disclaimer #2

This talk is designed to **introduce** you to presentations in L<sup>A</sup>T<sub>E</sub>X  
... and showcase cool features of Beamer

# Why Use L<sup>A</sup>T<sub>E</sub>X for Presentations (and everything else)?

BECAUSE MICROSOFT SUCKS!

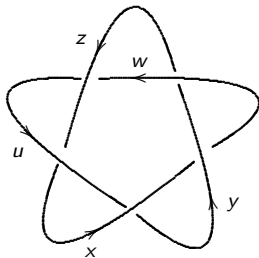
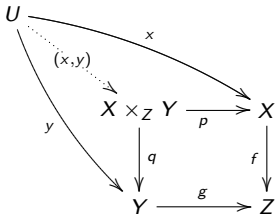
..... especially for mathematics .....

$$\frac{\partial^2 u}{\partial t^2} = c^2 \nabla^2 u$$

$$\int_0^{\infty} e^{-x} = 1$$

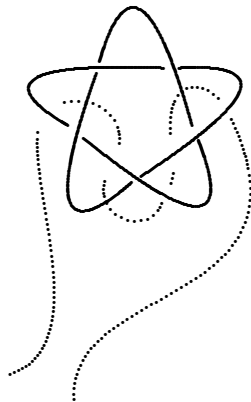
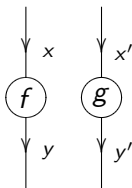
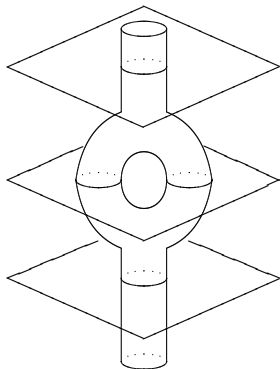
$$f(x) = a_0 + \sum_{n=1}^{\infty} \left[ a_n \cos\left(\frac{n\pi x}{L}\right) + b_n \sin\left(\frac{n\pi x}{L}\right) \right]$$

$$\Psi(x) = \begin{cases} 1 & \text{if } x < 0 \\ \frac{x^2}{4} & \text{if } x \geq 0 \end{cases}$$



# For the Pure Mathematicians. . .

L<sup>A</sup>T<sub>E</sub>X can DRAW cool diagrams!



# Why Use the *Beamer* Class?

## PROS

- 1 More bells & whistles than the *Prosper* class
- 2 Directly supported by **pdf<sub>l</sub>atex**
  - can still use latex2e, dvips, ps2pdf (HAVE to when using **pstricks**)
- 3 Rich overlay & transition effects
- 4 Navigational bars & symbols
- 5 Outputs: screen, handouts, notes, etc.
- 6 Customizable

## CONS

- 1 Isn't "what you see is what you get"

# Basic Code

- Beamer class loading with themes

```
\documentclass{beamer}  
\mode<presentation>  
\usetheme{Warsaw}           % Beamer Theme  
\usecolortheme{lily}       % Beamer Color Theme
```

- Title Page

```
\title{}  
\subtitle{}  
\author{}  
\institute{}  
\date{}  
  
\begin{document}  
\frame{           % the title page  
  \titlepage  
}  
:  
:  
\end{document}
```

# More Code

- Slides

```
\section{}  
\subsection{}  
\frame[options]{  
\frametitle{}  
  ...slide contents...  
}
```

- Many features you want to use require you to load packages, such as:

```
\usepackage{amsmath}    % for math AMS fonts  
\usepackage{graphicx}   % to include figures  
\usepackage{subfigure}  % to have figures in figures  
\usepackage{multimedia} % to include movies
```

# Themes

## FIVE THEME CATEGORIES

- 1 **Presentation** (*the slide template*)
- 2 **Color**\* (*color scheme for slide template*)
- 3 **Font**\*
- 4 **Inner**\* (*how you want bullets, boxes, etc. to look*)
- 5 **Outer**\* (*how you want the top/bottom of frames to look*)

\* **if you don't like the default of the Presentation Theme**

## EXAMPLE

```
\documentclass[compress, red]{beamer}
\usetheme{Warsaw}                    % Beamer Theme
\usecolortheme{lily}                  % Beamer Color Theme
\useoutertheme[subsection=false]{smoothbars} % Beamer Outer Theme
\useinnertheme{rectangles}            % Beamer Inner Theme
```



# Beamer *Options* Examples

- [**compress**]: makes all navigation bars as small as possible  
DEFAULT: uncompressed
- [**red**]: changes color scheme to red  
DEFAULT for beamer theme Warsaw: blue
- [**subsection=false**]: removes an extra bar above slide title  
stating the subsection title  
DEFAULT: true

# Using Color

\* BEAMER AUTOMATICALLY LOADS 'xcolor' \*

- Predefined colors:

red, blue, green, cyan, magenta, yellow, black, darkgray, gray, lightgray,  
orange, violet, purple, & brown

- To define new colors:

```
\xdefinecolor{darkgreen}{rgb}{0,0.35,0}: my new color is dark green
```

```
\xdefinecolor{purpleish}{cmyk}{0.75,0.75,0,0}: color is purple-ish
```

- Or substitute colors:

```
\colorlet{newred}{red!60!black}: my new color is dark red
```

# Overlays

There are multiple ways to do overlays:

① `\pause`

does the overlay sequentially

EXAMPLE

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## EXAMPLE

- I'm
- showing

# Overlays

There are multiple ways to do overlays:

- 1 `\pause`  
does the overlay sequentially

## EXAMPLE

- I'm
- showing
- you
- *pause*

# Overlays

There are multiple ways to do overlays:

- 1 `\pause`  
does the overlay sequentially

## EXAMPLE

- I'm
- showing
- you
- *pause*

```
\begin{itemize}
  \item I'm
  \item showing \pause
  \item you
  \item \textit{pause} \pause
\end{itemize}
```

# Overlays

There are multiple ways to do overlays:

① `\pause`

② `\item<n->` (means “from overlay n”)

`\item<2>` (means “only overlay 2”)

`\item<2,4>` (means “only overlay 2 & 4”)

does non-sequential overlays in the bullet-type (ie. `itemize`), environments

## EXAMPLE

● I'm

● showing

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## EXAMPLE

● showing

● you



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## EXAMPLE

● showing

● `\item<>`

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`\item<2>` (means “only overlay 2”)

`\item<2,4>` (means “only overlay 2 & 4”)

does non-sequential overlays in the bullet-type (ie. `itemize`), environments

## EXAMPLE

● showing

● `\item<>`

```
\begin{itemize}
  \item<1> I'm
  \item<1,2,3-> showing
  \item<2> you
  \item<3-> \textit{\backslash$ item$<>$}
\end{itemize}
```

# Overlays

There are multiple ways to do overlays:

- 1 `\pause`
- 2 `\item<n->`
- 3 `\onslide<n->`

non-sequential overlays in any environment!

## EXAMPLE

- I'm

# Overlays

There are multiple ways to do overlays:

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non-sequential overlays in any environment!

## EXAMPLE

- I'm showing

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## EXAMPLE

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non-sequential overlays in any environment!

## EXAMPLE

- I'm
- showing
- you
- `\onslide<>`

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- 1 `\pause`
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non-sequential overlays in any environment!

## EXAMPLE

- I'm
- showing
- you
- `\onslide<>`

```
\begin{itemize}
  \item I'm \onslide<2> showing
  \item \onslide<3-> showing \onslide<3> you
  \item \onslide<4-> you
  \item \textit{\backslash$ onslide$<>$}
\end{itemize}
```

# Overlays

There are multiple ways to do overlays:

① `\pause`

② `\item<n->`

③ `\onslide<n->`

④ Replace

- `\only<n>\{...\}`: successive
- `\uncover<n>\{...\}`: shows at n
- `\invisible<n>\{...\}`: hides at n
- `\alt<n>\{at n\}\{not at n\}`: 2 alternatives
- `\temporal<n>\{before\}\{at n\}\{after\}`: 3 alternatives
- `overprint` & `overlayarea` environments

⑤ Highlighting

- `\item<+-|alert+>`



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⑤ Highlighting

- `\item<+-|alert+>`
- `\item<2->\alert<n>\{stuff\}`

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- `\alt<n>{at n}{not at n}`: 2 alternatives
- `\temporal<n>{before}{at n}{after}`: 3 alternatives
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⑤ Highlighting

- `\item<+-|alert+>`
- `\item<2->\alert<n>{stuff}`
- `\item<2->\alt<3>{\color{green} stuff}{\color{red} stuff}`

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③ `\onslide<n->`

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- `\item<+-|alert+>`
- `\item<2->\alert<n>\{stuff\}`
- `\item<2->\alt<3>\{\color{green} stuff\}\{\color{red} stuff\}`

# Transition Effects

\* THIS SLIDE USES TRANSPARENT OVERLAYS: \*

```
\setbeamercovered{transparent}
```

## Text Animation:

- `\animate`, `\animatevalue`, etc.
- can do timed overlays, etc.

## Slide Transitions:

- Seven options: Blinds, Box, Dissolve, Glitter, Replace, Split, Wipe

### EXAMPLES

- Dissolve: `\transdissolve`
- Glitter: `\transglitter[direction=90]`
- Split (2 vertical lines sweep outward): `\transsplitverticalout`

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# Figures

- Standard L<sup>A</sup>T<sub>E</sub>X **figure** environment can be used.
- Using the **'graphicx'** package:
  - doesn't support all figures types:

easy fix: make ALL figures pdfs  
(eg. convert eps using **'epstopdf'**)

```
\begin{figure}  
  \includegraphics[width=\columnwidth]{myprettyfigure}  
\end{figure}
```

- can also use **\pgfimage**

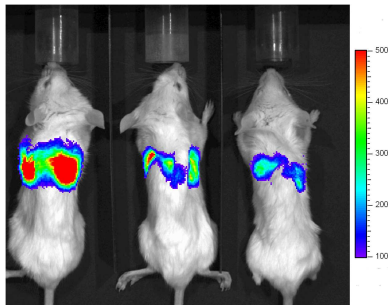
```
\pgfimage[height=4cm]{myprettyfigure}
```

\* **NOTICE that you don't have to specify the file type** \*

# Figures - Zooming

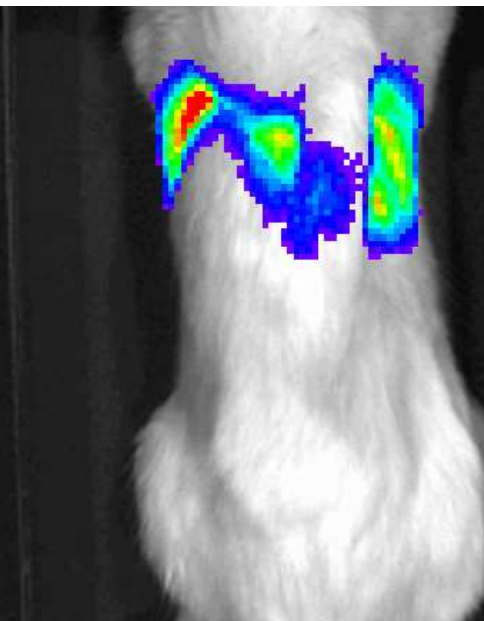
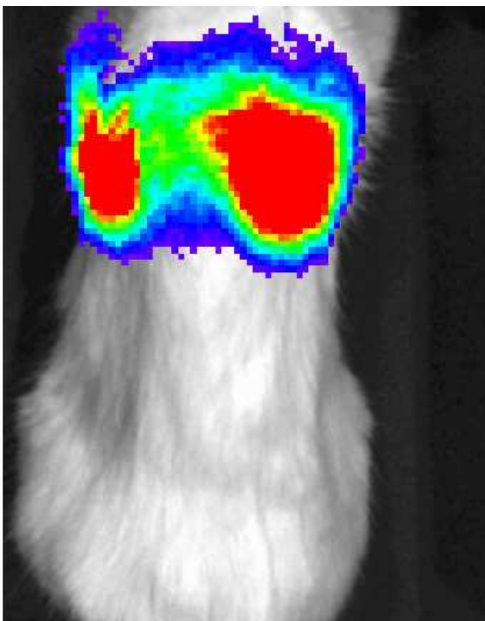
- You can zoom into portions of your figures

```
\framezoom< 1 >< 2 >[border](0cm, 3.5cm)(2.75cm, 1cm)  
\framezoom< 1 >< 3 >[border](3cm, 3.5cm)(1cm, 1cm)  
\pgfimage[height=4cm]{ambersmice}
```

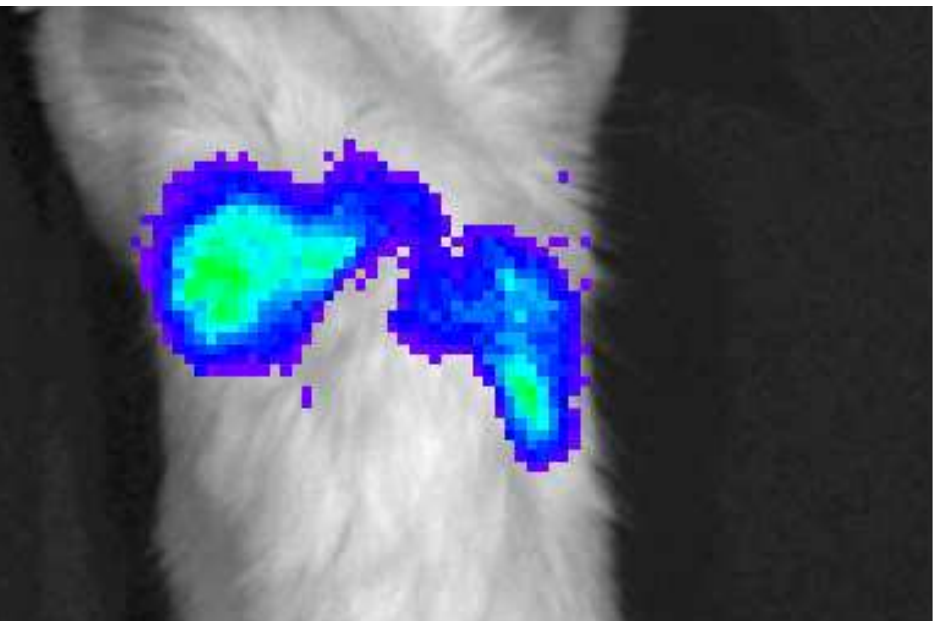




# Figures - Zooming



# Figures - Zooming



# Movies

```
\usepackage{multimedia}
.
.
\frame{
  \movie[height=1.125in,width=1.5in,poster]{}{Chemotaxis.mov}
}
```

\* `\movie[options]{text, picture, etc to click on}{name of movie}`

\* Should support all major movie types: `.avi`, `.mov`, etc.

**Problems: make sure Acrobat has the correct plug-ins!!!**

**Does NOT work on Linux/Unix systems?!?!**

\* You may need to use the `externalviewer` option

# Using Columns

The `column` environment is **extremely useful!**

- allows you to add as many columns as you want
- can put multiple column environments on any page

```
\begin{columns}[t]
  \column{0.25\textwidth}
  ... contents ...
  \column{0.5\textwidth}
  ... contents ...
  \column{0.25\textwidth}
  ... contents ...
\end{columns}
```

# Theorems, etc.

The `theorem`, `proof`, `block`, `example`, `definition`, etc. environments:

- For theorems/proofs

## Theorem

*Write your fantastic  
theorem here ...*

```
\begin{theorem}  
  Write your fantastic \\  
  theorem here $\dots$\br/>\end{theorem}
```

- Or to highlight points:

## Summary

- Beamer is cool!

```
\begin{block}{Summary}  
  \begin{itemize}  
    \item Beamer is cool!  
  \end{itemize}  
\end{block}
```

# Fragile Environments & Hyperlinks

## Fragile Environments

You CANNOT use `verbatim` without specifying it in the frame *options*:

```
\frame[containsverbatim]{ \frametitle{  
  \begin{verbatim}  
    ... contents ...  
  \end{verbatim}  
}
```

# Fragile Environments & Hyperlinks

## Fragile Environments

You CANNOT use `verbatim` without specifying it in the frame *options*:

```
\frame[containsverbatim]{ \frametitle{  
  \begin{verbatim}  
    ... contents ...  
  \end{verbatim}  
}
```

## Hyperlinks & Buttons:

You can create `buttons` to jump around your talk: [▶ Jump to Theorem #1](#)

- You need to put a `label` on the slide: `\frame[label=MyVerbatim]{`  
OR, `\label{theorem1}`
- To create the button:

```
\usepackage{hyperref}  
\frame{  
  \hyperlink{theorem1}{\beamergotobutton{Jump to Theorem \#1}}  
  \hypertarget{theorem1}{}  
}
```

# And, Finally ...

## OTHER USEFUL THINGS:

- Drawing diagrams
  - \* `xypic`: draws the diagrams I showed at beginning
  - \* the L<sup>A</sup>T<sub>E</sub>X `picture` environment
  - \* `pstricks`: can't use `pdflatex` with this
- Logo in the footer:
  - \* put `\logo{name}` in preamble
  - \* puts logo in bottom right corner
- References
  - \* Beamer Users Guide:  
[www.ctan.org/tex-archive/macros/latex/contrib/beamer/doc/beameruserguide.pdf](http://www.ctan.org/tex-archive/macros/latex/contrib/beamer/doc/beameruserguide.pdf)
  - \* Google: if you think Beamer should be able to do it, Google it.