1 Beamer basics
   - Frames
   - Frame contents
   - Frame titles
   - Table of contents

2 Presentation flow
   - Overlays
   - The pause command
   - More flexible control
   - An example

3 Miscellaneous
   - Themes
   - Verbatim
   - Columns
   - Links
A beamer presentation consists of pages called frames. You are looking at a frame.
A beamer presentation consists of pages called frames. You are looking at a frame.

Create a frame as follows:

\begin{frame}
  ...
\end{frame}
A beamer presentation consists of pages called frames. You are looking at a frame.

Create a frame as follows:

\begin{frame}
... \\
\end{frame}

The contents of the frame can be pretty much any latex stuff.
You can use the usual environments like theorem, definition, etc:
You can use the usual environments like theorem, definition, etc:

**Theorem (Stokes)**

\[ \int_M d\omega = \int_{\partial M} \omega \]

**Proof.**

Left as an exercise.
You can put big formulas:
You can put big formulas:

\[
\vec{\nabla}_V \begin{pmatrix}
-\phi_1 E_2 \\
\phi_1 E_1 + N \\
-E_2
\end{pmatrix} = \begin{pmatrix}
-\partial_2(\phi_1) E_2 - \phi_1 \vec{\nabla}_V E_2 \\
\partial_2(\phi_1) E_1 + \phi_1 \vec{\nabla}_V E_1 + \vec{\nabla}_V N \\
-\vec{\nabla}_V E_2
\end{pmatrix}
= \begin{pmatrix}
-\phi_{12} E_2 + (\cos \phi) \phi_1 N \\
\phi_{12} E_1 + (\sin \phi) \phi_1 N - (\sin \phi) E_1 + (\cos \phi) E_2 \\
(cos \phi) N
\end{pmatrix}
\]
Frame contents

You can put in graphics:
You can put in graphics:

![Figure: Spherical geometry!](image-url)
Frames can have titles and subtitles.
Frames can have titles and subtitles.
Create them as follows:

\begin{frame}
  \frametitle{This is the frame title}
  \framesubtitle{This is the subtitle}
  ...
\end{frame}
Using \section and \subsection create a table of contents.
Using \section and \subsection create a table of contents. To create a frame with the table of contents, use:

**LaTeX Code**

```latex
\begin{frame}
  \frametitle{Contents}
  \tableofcontents
\end{frame}
```
Overlays

Note that the frame contents are unveiled piece by piece.
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Incidentally, here is a mysterious button: © Mystery
Overlays
The pause command

Inserting a \pause splits the frame into multiple slides.
Overlays

The pause command

Inserting a `\pause` splits the frame into multiple slides. The code for the previous frame is:

LaTeX Code

```latex
Note that the frame contents are unveiled piece by piece.
\pause
That is, a frame may consist of multiple slides.
\pause
You have control over how the frame is unveiled.
```
Overlays
The pause command

This is useful for talking through the steps of a proof, for example.
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**Theorem**

\[ \int_M \text{Pf} \left( \frac{\Omega}{2\pi} \right) = \chi(M) \]
Overlays
The pause command

This is useful for talking through the steps of a proof, for example.

**Theorem**

\[ \int_{\mathcal{M}} \text{Pf} \left( \frac{\Omega}{2\pi} \right) = \chi(\mathcal{M}) \]

**Proof.**

Go to the library.
Overlays

The pause command

This is useful for talking through the steps of a proof, for example.

Theorem

$$\int_{\mathcal{M}} \operatorname{Pf} \left( \frac{\Omega}{2\pi} \right) = \chi(\mathcal{M})$$

Proof.

Go to the library.
Get Spivak Vol 5.
Overlays

The pause command

This is useful for talking through the steps of a proof, for example.

**Theorem**

\[ \int_M \text{Pf} \left( \frac{\Omega}{2\pi} \right) = \chi(M) \]

**Proof.**

Go to the library.
Get Spivak Vol 5.
Read the proof there.
For most environments, an overlay specification can be given.
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For most environments, an overlay specification can be given. This tells the environment on which slides it should take effect. For example:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Effective on</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2&gt;</td>
<td>Slide 2 only</td>
</tr>
<tr>
<td>&lt;2-&gt;</td>
<td>Slides 2 and later</td>
</tr>
<tr>
<td>&lt;2,4&gt;</td>
<td>Slides 2 and 4</td>
</tr>
<tr>
<td>&lt;-3,7–9&gt;</td>
<td>Slides 1 to 3 and 7 to 9</td>
</tr>
</tbody>
</table>
For example, we can make an itemized list which is revealed one item at a time, and with the current item bold:
Overlays
Overlay specifications - an example

For example, we can make an itemized list which is revealed one item at a time, and with the current item bold:

\begin{itemize}
\item<1-> \textbf<1>{Item 1}
\item<2-> \textbf<2>{Item 2}
\ ...
\item<5-> \textbf<5>{Item 5}
\end{itemize}
Overlays

Overlay specifications - an example

Here is the result:

- **Item 1**
Overlays
Overlay specifications - an example

Here is the result:

- Item 1
- **Item 2**
Overlays

Overlay specifications - an example

Here is the result:

- Item 1
- Item 2
- **Item 3**
Overlays
Overlay specifications - an example

Here is the result:

- Item 1
- Item 2
- Item 3
- **Item 4**
Overlays
Overlay specifications - an example

Here is the result:

- Item 1
- Item 2
- Item 3
- Item 4
- **Item 5**
Overlays
Overlay specifications - an example

Here is the result:

- Item 1
- Item 2
- Item 3
- Item 4
- Item 5

The overlay specifications do different things to different commands, but it is usually obvious.
At the beginning of this document is:

LaTeX Code
\documentclass{beamer}
\usetheme{Copenhagen}
At the beginning of this document is:

\begin{verbatim}
\documentclass{beamer}
\usetheme{Copenhagen}
\end{verbatim}

There are many other themes to use. These have different colors, borders, and so on.
The `verbatim` environment can be used to show code:
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```java
import de.jreality.plugin.JRViewer;
public static void main(String[] args){
    JRViewer jrv = new JRViewer();
    jrv.addBasicUI();
    jrv.startup();
}
```
The `verbatim` environment can be used to show code:

```java
import de.jreality.plugin.JRViewer;
public static void main(String[] args){
    JRViewer jrv = new JRViewer();
    jrv.addBasicUI();
    jrv.startup();
}
```

If you do this, you must start the frame with \begin{frame}[fragile]
Use the \texttt{columns} environment to split a frame into columns:
Use the `columns` environment to split a frame into columns:

Below will be a theorem and proof.

**Theorem**

*Here is a theorem in one column.*

**Proof.**

*Here is a proof.*

Here is an example block:

**Example**

*An example*

And a list:

- Item 1
- Item 2
- Item 3
Links can be created between frames. On this frame is:

**LaTeX Code**

\hyperlink{A}{\beamergotobutton{Link example}}
\hypertarget{B}<3>{}

On the table of contents is the mysterious button:

**LaTeX Code**

\hyperlink{B}{\beamerreturnbutton{Mystery}}
\hypertarget{A}<4>{}

Here is the button:

Link example
Links can be created between frames. On this frame is:

\begin{itemize}
  \item \texttt{LaTeX Code}
  \begin{verbatim}
    \hyperlink{A}{\beamergotobutton{Link example}}
    \hypertarget{B}<3>{}
  \end{verbatim}
  \end{itemize}

On the table of contents is the mysterious button:

\begin{itemize}
  \item \texttt{LaTeX Code}
  \begin{verbatim}
    \hyperlink{B}{\beamerrreturnbutton{Mystery}}
    \hypertarget{A}<4>{}
  \end{verbatim}
  \end{itemize}
Links can be created between frames. On this frame is:

**LaTeX Code**
\begin{verbatim}
\hyperlink{A}{\beamergotobutton{Link example}}
\hypertarget{B}<3>{}
\end{verbatim}

On the table of contents is the mysterious button:

**LaTeX Code**
\begin{verbatim}
\hyperlink{B}{\beamerreturnbutton{Mystery}}
\hypertarget{A}<4>{}
\end{verbatim}

Here is the button: ▶ Link example
That’s all—but there is much more to beamer.
That’s all—but there is much more to beamer.

Visit http://math.arizona.edu/~tdm/beamer to find:

- This file and a simple beamer template
- Links to various beamer documents
- A link to a website which shows some themes