Explanatory note on the LaTeX thesis template

Before using the template ..... you are assumed to have:

Basic knowledge of using LaTeX

This template may help you to:

Make Table of contents
Insert figures
Write different kinds of equations
Make bibliography by using BibTeX
Graduate successfully

This template (template.zip) consists of many files:

Main files (cannot be deleted):

template.tex	backbone of the template
thesis.sty	thesis style file
biblio.bib	bibliography data
phaip.bst	bibliography style

Put the above files under the same directory.

Example files

intro.tex	examples of figures, tables and equations
abs.tex, ackn.tex, aniso3.tex, energy.tex	
	examples of what a "real" thesis looks like
*.eps files	sample figures

Other files:

bst.zip	bibliography style files
.emacs	emacs patch file (in UNIX)
template.pdf	this file
texshell.zip	editor for LaTeX under Windows 95/98

Compatibility:

UNIX: LaTeX 2ε
Win95/98:   MiKTeX 1.08 or up (Download at http://www.miktex.org/)

Editor:

UNIX: pico/emacs (need patch file .emacs)
Win95/98:   TeXShell/WinEdt

DVI Viewer:

UNIX: xdvi
Win95/98:   yap (Included in MiKTeX package)

Postscript Viewer:

UNIX: ghostview
Win95/98:   GSView (Download at http://www.cs.wisc.edu/~ghost/)

Note: in the axp mechines, you need to type:

          dvips   -o   xxxxx

to change the file xxxxx.dvi to xxxxx.ps

Important command: psnup

Syntax: psnup   xxxxx.ps   yyyyy.ps   –x

Try it yourself; you can change the number x to 3, 4 ..etc.

The template can be downloaded in the Physics Homepage:

http://www.phy.cuhk.edu.hk/links/network.html

Read the files intro.tex and aniso3.tex for more examples.

1.   <u>Getting Started</u>

At the beginning of the template file (template.tex), you will find:

% LaTeX 2e
\documentclass[12pt]{report}
\usepackage{thesis}
\usepackage{amsmath,amssymb}
\usepackage{float,multicol,epsfig}

If you are using LaTeX 2.09:

% LaTeX 2e
%\documentclass[12pt]{report}
%\usepackage{thesis}
%\usepackage{amsmath,amssymb}
%\usepackage{float,multicol,epsfig}

% LaTeX 2.09
\documentstyle[12pt,amsmath,amssymb,thesis,float,multicol,epsfig]{report}

Don' t edit anything until you see the following lines:

\begin{document}
\title{\LaTeX\ Template for MPhi. and PhD. Thesis}
\author{Entertainer Skywalker}
\degree{2}   % 1 for PhD, 2 for MPhil, 3 for MSc
\dept{Physics}
\submitdate{1st June, 2000}

LaTeX Template for MPhi. and PhD. Thesis

Entertainer Skywalker

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Philosophy
in
Physics

2. <u>Front Matter</u>

Then you need to write the abstract and acknowledgement:

```
%%%%% front matters %%%%%
\input{abs}
\input{ackn}
```

You only need to edit abs.tex

```
\chapter*{Abstract}
In this document we show several examples done by \LaTeX\ that may be useful in
thesis writing.  The page format in this template have been used by many
post-graduate students for thesis writing. However, due to the lack of
knowledge in this aspect, many useful techniques are not included here.

The body of this template is quite long. Due to the lack of time, the
organization of the body may not be so good.
```

This is the result:

Abstract

In this document we show several examples done by LaTeX that may be useful in thesis writing. The page format in this template have been used by many post-graduate students for thesis writing. However, due to the lack of knowledge in this aspect, many useful techniques are not included here.

The body of this template is quite long. Due to the lack of time, the organization of the body may not be so good.

3.   <u>Main Body</u>

The main body may look like this:

```
%%%%% front matters %%%%%
% Chapters
\input{intro}
\input{aniso3}
```

The line \input{intro} will insert a text file intro.tex:

```
\chapter{Introduction}\label{introduction}

Several examples of \LaTeX\ will be given in this chapter. Note that this
document is written in the format of \LaTeX\ 2$\varepsilon$
\cite{LaTeX-Companion}. We have used several packages in this document, all the
packages used have been installed in the DEC Alpha Workstation (i.e. the axp
machines). You may need the corresponding \verb=.sty= files in PC version of
\LaTeX\ .  The package \verb=amsmath= is necessary for the environment
\verb=\text= and \verb=split=.
```

Chapter 1

Introduction

Several examples of LaTeX will be given in this chapter. Note that this document is written in the format of LaTeX 2ε [1]. We have used several packages in this document, all the packages used have been installed in the DEC Alpha Workstation (i.e. the axp machines). You may need the corresponding .sty files in PC version of LaTeX . The package amsmath is necessary for the environment \text and split.

3.1 <u>Figures</u>

Inside intro.tex, you will find a lot of examples

\begin{figure}[H]
\centerline{\epsfig{file=odie.eps,width=0.6\linewidth}}
\caption{\small Odie the happy dog.}
\label{odie}
\end{figure}

Figure 1.1: Odie the happy dog.

* The options [H] means to put the figure here.
* You may change the option to [htbp], the figure will fit the page.
* Only .ps and .eps files are supported.

3.2   <u>Multi-columns</u>

Make use of environment minipage:

```
\begin{minipage}[b]{0.5\linewidth}
\begin{figure}[H]
\centerline{\epsfig{file=softhard.eps,width=5cm}}
\caption{\small A pair of famous DJ.}
\label{softhard}
\end{figure}
\end{minipage}\hfill
\begin{minipage}[b]{0.4\linewidth}
\begin{figure}[H]
\centerline{\epsfig{file=einstein.eps,width=5cm}}
\caption{\small A famous scientist.}
\label{einstein}
\end{figure}
\end{minipage}
```

*   {0.5\linewidth} is the width of the column.
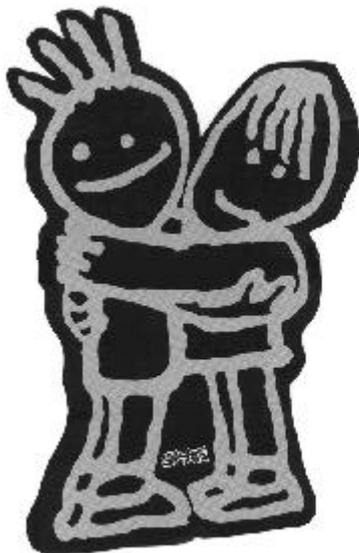*   The total width of the columns cannot exceed the linewidth

Figure 1.2: A pair of famous DJ.
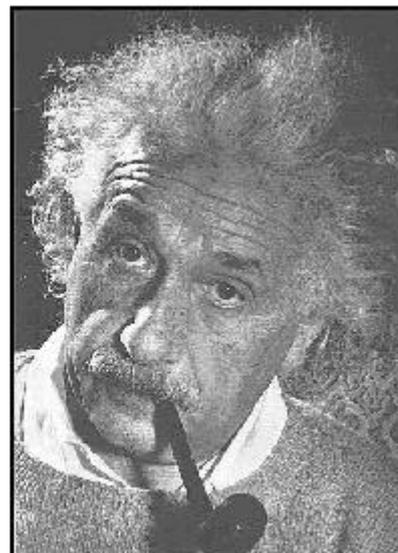

Figure 1.3: A famous scientist.

3.3   <u>Special Equations</u>

3.3.1   Long Equation

Make use of the environment [split] (supported by amsmath)

\begin{equation}
\begin{split}
\epsilon_e &=
\frac{1}{V E_0^2}\sum_{i=1}^{i=n}
\int_{V_i}\text{\bf{D}}_i \cdot \text{\bf{E}}_i dV_i
+ 2 p \epsilon_m b\\
&= \frac{1}{V E_0^2}\int_0^{2\pi} 2\pi\sin{\theta}d\theta
{\bigg\lgroup}
  \epsilon_i\int_0^{r_1}|\nabla\varphi_0^c|^2 r^2dr \\
& \quad +\epsilon_s\int_{r_1}^{r_2}|\nabla\varphi_0^s|^2 r^2dr
+\epsilon_m\int_{r_2}^{R}|\nabla\varphi_0^m|^2 r^2dr
{\bigg \rgroup} + 2 p \epsilon_m b.
\end{split}
\end{equation}

$$
\begin{split}
\epsilon_e &= \frac{1}{VE_0^2}\sum_{i=1}^{i=n}\int_{V_i} \mathbf{D}_i \cdot \mathbf{E}_i dV_i + 2p\epsilon_m b \\
&= \frac{1}{VE_0^2}\int_0^{2\pi} 2\pi\sin\theta d\theta \left[\epsilon_i \int_0^{r_1} |\nabla\varphi_0^c|^2 r^2 dr \right. \\
&\quad \left. + \epsilon_s \int_{r_1}^{r_2} |\nabla\varphi_0^s|^2 r^2 dr + \epsilon_m \int_{r_2}^{R} |\nabla\varphi_0^m|^2 r^2 dr \right] + 2p\epsilon_m b.
\end{split}
$$

3.3.2 Equation with several cases

\begin{equation}
\rho(x)= \left \{ \begin{array}{lll}
n_{1}^{2}   & {\\   \rm for \\} 0<x<a \\
&\\
n_{2}^{2}   & {\\ \rm for \\} a+b<x<a+b+c \\
&\\
1   & {\\ \rm otherwise}
\end{array}
\right.
\end{equation}

$$\rho(x) = \left\{ \begin{array}{lll} n_1^2 & \text{for } 0 < x < a \\ n_2^2 & \text{for } a+b < x < a+b+c \\ 1 & \text{otherwise} \end{array} \right.$$

3.3.3 Matrix Equation

\begin{equation}
\left[
\begin{array}{c}
A \\
B
\end{array}
\right]
=
\left[
\begin{array}{cc}
 T_{11} & T_{12}   \\
 T_{21} & T_{22}
\end{array}
\right]
\left[
\begin{array}{c}
C \\
D
\end{array}
\right]
\end{equation}

$$\left[\begin{array}{c} A \\ B \end{array} \right] = \left[\begin{array}{cc} T_{11} & T_{12} \\ T_{21} & T_{22} \end{array} \right] \left[\begin{array}{c} C \\ D \end{array} \right]$$

3.4   <u>Tables</u>

\begin{table}[htbp]
\caption{\small List of values of $\langle y\rangle$ and σ, and the
corresponding values of y_0 for $P_G(y)$ and $P_{ln}(y)$, for p=0.1.}
\label{table}
\end{table}
\begin{center}
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline
$\langle y\rangle$ &0.2 &0.2 &0.2 &0.3 &0.3 &0.3\\
σ &0.0 &0.1 &0.2 &0.0 &0.1 &0.2\\
y_0 (P_G) &0.20000 &0.14811 &-0.12623&0.30000 &0.29373 &0.19628\\
y_0 (P_{ln}) &0.20000 &0.19900 &0.19600&0.30000 &0.29850 &0.29406\\
\hline
\end{tabular}
\end{center}

Table 1.1: List of values of $\langle y\rangle$ and σ, and the corresponding values of y_0 for $P_G(y)$ and $P_{ln}(y)$, for p=0.1.

$\langle y\rangle$	0.2	0.2	0.2	0.3	0.3	0.3
σ	0.0	0.1	0.2	0.0	0.1	0.2
y_0 (P_G)	0.20000	0.14811	-0.12623	0.30000	0.29373	0.19628
y_0 (P_{ln})	0.20000	0.19900	0.19600	0.30000	0.29850	0.29406

*   The option {|c|c|c|c|c|c|c|} is the number of columns.
*   Use the symbol & as alignment.
*   You can also make caption for tables.

4. Bibliography (using BibTeX)

We are going to make bibliography:

% Bibliography
\clearpage
\beforebibliography
\bibliographystyle{phaip}
\pagestyle{plain}
\bibliography{biblio}

The main files for making bibliography are biblio.bib and phaip.bst:

biblio.bib	bibliography database
phaip.bst	bibliography style

4.1   Why using BibTeX?

i.   References are sorted automatically.
ii. Only cited references will appear.
iii. Change style easily (use different .bst files).

How to use BibTeX?

Every time you have changes your citation, you type:

        bibtex template.tex

Then compile the file **TWICE**:

        latex template.tex
        latex template.tex

The resulting bibliography will look like this:

Bibliography

[1] M. Goossens, F. Mittelbach, and A. Samarin, *The LaTeX Companion*, Addison-Wesley, Reading, 1994.

[2] K. P. Yuen, M. F. Law, K. W. Yu, and P. Sheng, Phys. Rev. E **56**, R1322 (1997).

[3] N. W. Ashcroft and N. D. Mermin, *Solid State Physics*, Holt, Rinehart and Winston, New York, 1976.

[4] S. Berthier, J. Phys I (France) **4**, 303 (1994).

Note that reference [1] is the book that appears in Chapter 1.

Example: add the citation KPYuen:1:

Several examples of \LaTeX\ will be given in this chapter.
Note that this document is written in the format of
\LaTeX\ 2ε \cite{LaTeX-Companion, KPYuen:1}.

Several examples of LaTeX will be given in this chapter. Note that this document is written in the format of LaTeX 2ε [1, 2]. We have used several packages in this document, all the packages used have been installed in the DEC Alpha Workstation

[1] M. Goossens, F. Mittelbach, and A. Samarin, *The LaTeX Companion*, Addison-Wesley, Reading, 1994.

[2] K. P. Yuen and K. W. Yu, J. Phys.: Condens. Matter **9**, 4669 (1997).

4.2 Bibliography style

You can change the bibliography style by:

\bibliographystyle{ieeetr}

Bibliography

[1] M. Goossens, F. Mittelbach, and A. Samarin, *The LaTeX Companion*. Reading: Addison-Wesley, 1994.

[2] K. P. Yuen, M. F. Law, K. W. Yu, and P. Sheng, "Optical nonlinearity enhancement via induced anisotropy," *Phys. Rev. E*, vol. 56, p. R1322, 1997.

[3] N. W. Ashcroft and N. D. Mermin, *Solid State Physics*. New York: Holt, Rinehart and Winston, 1976.

Change the style to abbrv, citations are in alphabetical order:

\bibliographystyle{abbrv}

Bibliography

[1] N. W. Ashcroft and N. D. Mermin. *Solid State Physics*. Holt, Rinehart and Winston, New York, 1976.

[2] D. J. Bergman. Dielectric constant of a two-component granular composite: A practical scheme for calculating the pole spectrum. *Phys. Rev. B*, 19(4):2359, Feb. 1979.

Compare the results with the phaip style
The styles are stored in bst.zip, test the styles yourself!

4.3   Bibliography database

Inside biblio.bib, you will see:

```
@preamble{ "\newcommand{\noopsort}[1]{} "
    # "\newcommand{\printfirst}[2]{#1} "
    # "\newcommand{\singleletter}[1]{#1} "
    # "\newcommand{\switchargs}[2]{#2#1} " }

@STRING{pra    ="Phys. Rev. A"}
@STRING{prb    ="Phys. Rev. B"}
@STRING{pre    ="Phys. Rev. E"}
@STRING{prl    ="Phys. Rev. Lett."}
@STRING{pf     ="Phys. Fluids"}
@STRING{jchp   ="J. Chem. Phys."}
@STRING{jrh    ="J. Rheol."}
@STRING{jap    ="J. Appl. Phys."}

%%%%% Articles from journals %%%%%
@ARTICLE{DJBergman:1,
  author = {David J. Bergman},
  title = {Dielectric constant of a two-component granular composite:
A practical scheme for calculating the pole spectrum},
  journal = prb,
  year = 1979,
  volume = 19,
  number = 4,
  pages = "2359",
  month = Feb}
```

*   The command @string define a "string" for several journals.
*   For articles, you do not need to type the title.

There are also some examples for books:

```
%%%%% Books %%%%%
@BOOK{LaTeX-Companion,
  author = {Michel Goossens and Frank Mittelbach and Alexander Samarin},
  title = {The \LaTeX\ Companion},
  publisher = "Addison-Wesley",
  address = "Reading",
  year = 1994}
```

You may find many other examples in biblio.bib.

5. <u>**Appendix**</u>

After the line \appendix, the chapter name will become an appendix.

% Appendix
\clearpage
\appendix
\input{energy}

Inside, the file energy.tex, you will find:

\chapter{Potential energy function and dipolar factor}\label{potential}

Consider a system of concentric spherical (cylindrical) inclusions
of radius r_1 and r_2, upon the application of an external electric
field in the z direction, the potential energy function of the system
is given by:

And this is the final result:

Appendix A

Potential energy function and dipolar factor

Consider a system of concentric spherical (cylindrical) inclusions of radius r_1
and r_2, upon the application of an external electric field in the z direction, the
potential energy function of the system is given by:

Happy LaTeXing (and graduate successfully)

Please e-mail to 3@mad.scientist.com **for any bug.**