The LiteBook Template

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CHAPTER

Introduction to the Template

1.1 The purpose of this package

This template provides a streamlined design for typesetting books. Welcome to feedback bugs or ideas via email xiamyphys@gmail.com or GitHub.

This template is used by me to reformat the textbook *General Relativity, R. Wald*, and I also use this template to typesetting my notes on *Group Theory in Physics*. You can download them on GitHub.

1.2 Installing LiteBook and loading it

For portable version, simply download latest `litebook.cls` file from GitHub or CTAN and save it under your working directory. This way of installation is simple and convenient, but you have to manually update `.cls` now and then.

However, I strongly suggest that you should use terminal/cmd to implement the commands to update all the packages (and install this package) to the latest version or switch to portable version instead

```
sudo tlmgr update --self --all
```

If you are in some areas with awful Internet environment (such as GFW), you can choose a proper mirror source or use other means[1]. To learn more, please refer to How do I update my TeX distribution?

1.3 Compatibility

The test environments are macOS + MacTeX 2024 / Overleaf / Ubuntu 22.04.2 and they all work fine for pdfLaTeX and XeLaTeX compilers. Windows and Unix platforms' unknown. The compiling time of current document via pdfLaTeX compiler is about 1s on MacBook Air M2 8 GB (macOS 14.4.1) when charging.

1.4 Cover configurations

There are several lines of information and a cover image on the cover of this document, the corresponding commands are the following

```
\cover{\UPLOWFadingImage[trim={0 {.9\paperheight} 0 0},clip]{cover}
                        [trim={0 {.5\paperheight} 0 0},clip]{cover}}
\title{\scshape The \pkg{LiteBook} Template}
\subtitle{Version 0.2b \today}        \author{Hsia Mingyu}
\bioinfo{Hangzhou Dianzi University}
\press{\scshape The University of Chicago Press}
```

The same as the book class, the macro `title` could not be omitted, or it will return an error, and there will be a warning if the macro `author` is omitted. The `cover` can assign the format of the image on the cover and you can adjust the format of the image with the fadingimage package.

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[1]Please comply with local network regulations.

1.5   Math options of this template

```
\documentclass[<math>]{litebook}
```

You can set the math font to be newtx (default) or mtpro2.

1.6   Preset packages and commands

This template has preset with the following packages:

amsthm	bm	cancel	derivative	esvect	extarrows	fixdif	nicefrac
nicematrix	physics2	refstyle	siunitx	booktabs	diagbox	fontawesome5	geometry
indentfirst	mdframed	multicol	multirow	setspace	tabularx	tikz	xcolor

You can click on them to go to the homepage to view the documentation.

And commands \i, \e, \T have been defined to input i, e in roman (non-italic) text and matrix transpose symbol T, which can help you typeset math quickly.

The template has preset the following commands for different type of references via refstyle package: \eqref{<label>}, \figref{<label>} and \tabref{<label>}, you can add other ref commands via refstyle package.

1.7   Equation test

The following is the Schrödinger Equation

$$i\hbar \frac{\partial}{\partial t} \Psi(\boldsymbol{r}, t) = \left[-\frac{\hbar^2}{2m} \nabla^2 + V(\boldsymbol{r}, t) \right] \Psi(\boldsymbol{r}, t) \tag{1.7.1}$$

Eq. (1.7.1) is the time-dependent Schrödinger Equation for the nonrelativistic particle.

1.8   Figure and caption side by side test

Figure 1.1. A diagram showing the causal structure of spacetime in special relativity. The "light cone" of p rather than a "surface of simultaneity" with p now plays a fundamental role in determining the causal relationship of p to other events.
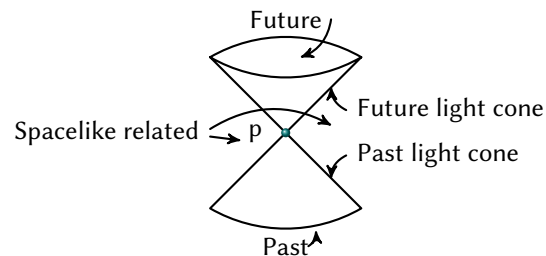
Here, fig. 1.1 is a diagram showing the causal structure of spacetime in special relativity.

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CHAPTER

Appendix: Package thmlist

This template has preset two *styles* of theorem environment via the thmlist package, you can create a series of environments with the two styles

```
\mdflist{theorem,   lemma,        definition,   proposition,    postulate;
         Theorem,   Lemma,        Definition,   Proposition,    Postulate;
         DarkGreen, MidnightBlue, MidnightBlue, DarkOliveGreen, Indigo}
\amslist{remark,    example,      problem,      solution;
         Remark,    Example,      Problem,      Solution;
         DarkRed,   Teal,         Black,        Black}
```

You can add the environments like the two commands above as you need. For more information, please refer to the document of the thmlist package. The following are the effects of the two styles.

The next five environments show the style of the mdframed package.

Theorem 2.0.1 (The Theorem Environment).
From WikipediA: A theorem is a statement that has been proved, or can be proved.

Lemma 2.0.1 (The Lemma Environment).
From WikipediA: In mathematics, informal logic and argument mapping, a lemma (pl.: lemmas or lemmata) is a generally minor, proven proposition which is used as a stepping stone to a larger result. For that reason, it is also known as a "helping theorem" or an "auxiliary theorem".

Definition 2.0.1 (The Definition Environment).
From WikipediA: A definition is used to give a precise meaning to a new term, by describing a condition which unambiguously qualifies what a mathematical term is and is not.

Proposition 2.0.1 (The Proposition Environment).
From WikipediA: A proposition is a central concept in the philosophy of language, semantics, logic, and related fields, often characterized as the primary bearer of truth or falsity.

Postulate 2.0.1 (The Postulate Environment).
From WikipediA: A postulate is a statement everyone agrees to be correct.

The next four environments show the style of the amsthm package.

Remark (The Remark Environment).
From Math StackExchange: The remark device is used for material that is is too long to be included in parentheses, while it deserves greater prominence than a footnote.

Example 1. From Cambridge Dictionary: The example is a way of helping someone to understand something by showing them how it is used.

Problem 1. From Springer: A problem is generally considered to be a task, a situation, or person which is difficult to deal with or control due to complexity and intransparency.

Solution . The quick brown fox jumps over the lazy dog.