上海科技大学
ShanghaiTech University

利用LaTeX撰写论文
Using LaTeX to edit manuscripts for scientific papers

上科大图信中心
物质学科馆员 陆晴博士
Dr. Qing Lu, Subject Information Specialist
Library and Information Services

上海科技大学
ShanghaiTech University

Outline

- Getting started with LaTeX
- Building the structure of a paper
- Math Mode in LaTeX
- Figures in LaTeX
- Creating Tables in LaTeX
- Cross-referencing in LaTeX
- Creating a bibliography in LaTeX

上海科技大学
ShanghaiTech University

1. Getting Started with LaTeX

What is LaTeX?

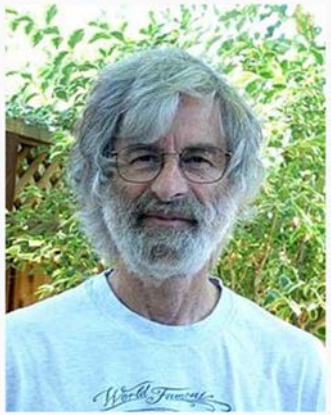
- LaTeX is a software for typesetting documents. It is a document preparation system.
- LaTeX is a free, open source software. It was originally written by Leslie Lamport and is based on the TeX typesetting engine by Donald E. Knuth.

Donald Knuth
ForMemRS

Knuth in 2005

Born	Donald Ervin Knuth January 10, 1938 (age 80) Milwaukee, Wisconsin, U.S.

Leslie Lamport



Born	February 7, 1941 (age 77) New York City, New York
Alma mater	MIT (BSc) Brandeis University (PhD)

How we can benefit

- LaTeX is especially well-suited for scientific and technical documents because of
- superior typesetting of mathematical formulas
- cross-referencing capabilities
- automatic numbering
- able to use PostScript and PDF features
- intelligent formatting even with default styles
- many free templates, styles online

Portability

- LaTeX is available for nearly every operating system, like Windows, Linux, Mac OS.
- Its file format is plain text that is readable and editable on all operating systems. LaTeX will produce the same output on all systems.
- Though there are different LaTeX software packages, so called TeX distributions, this tutorial will focus on Tex Live, because it is available for Windows, Linux and Mac OS.
- LaTeX itself doesn’t have a graphical user inferface. You can choose any text editor. There are many editors, even specialized in LaTeX, for every operating system. TeXworks runs on Windows, Linux and Mac OS.

Installing LaTeX

- TeX Live is a distribution of LaTeX that is available for Windows, Mac OS, Linux and other Unix-like system.
- TeX Live is well maintained and being actively developed.
- Open the TeX Live homepage at http://tug.org/texlive

Another very good and user-friendly LaTeX distribution for Windows is MikTeX. It is easy to install like any other Windows application, but not available for Linux or Mac OS. You can download it from http://miktex.org

TeX Live homepage

http://tug.org/texlive

TeX Live

TeX Live is an easy way to get up and running with the TeX document production system. It provides a comprehensive TeX system with binaries for most flavors of Unix, including GNU/Linux, and also Windows. It includes all the major TeX-related programs, macro packages, and fonts that are free software, including support for many languages around the world.

- **How to acquire TeX Live:** download, on DVD, other methods.
- Quick install for Unix; installation and release notes for Windows; for MacOSX, see the MacTeX distribution.
- Documentation
- Contact and mailing lists.
- Known issues and highlights of changes in the current release (details for LuaTeX, pdfTeX, XeTeX).

- Portable (USB and DVD) usage of TeX Live.
- Installing/updating packages after installation and full upgrade from previous years.

- TeX Live licensing, and integration with operating system distributions.
- Development source repository, and building the sources.
- How you can help.

- Current release: TeX Live 2018 is available over the Internet and on DVD. It was released on 28 April 2018, and ongoing updates are available.

Some starting points for actually using TeX are in this introduction to the TeX world.

Install TeXLive in Windows

- http://tug.org/texlive/acquire-netinstall.html

Installing TeX Live over the Internet

TeX Live 2018 was released on April 28.

For typical needs, we recommend starting the TeX Live installation by downloading install-tl-windows.exe for Windows (15mb), or install-tl-unx.tar.gz (3mb) for everything else. There is also a zip archive install-tl.zip (19mb) which is the same as the `.exe`. Although the .zip archive works fine on all platforms, the .tar.gz is much smaller, since it omits installation support programs needed only on Windows. The archives are otherwise identical.

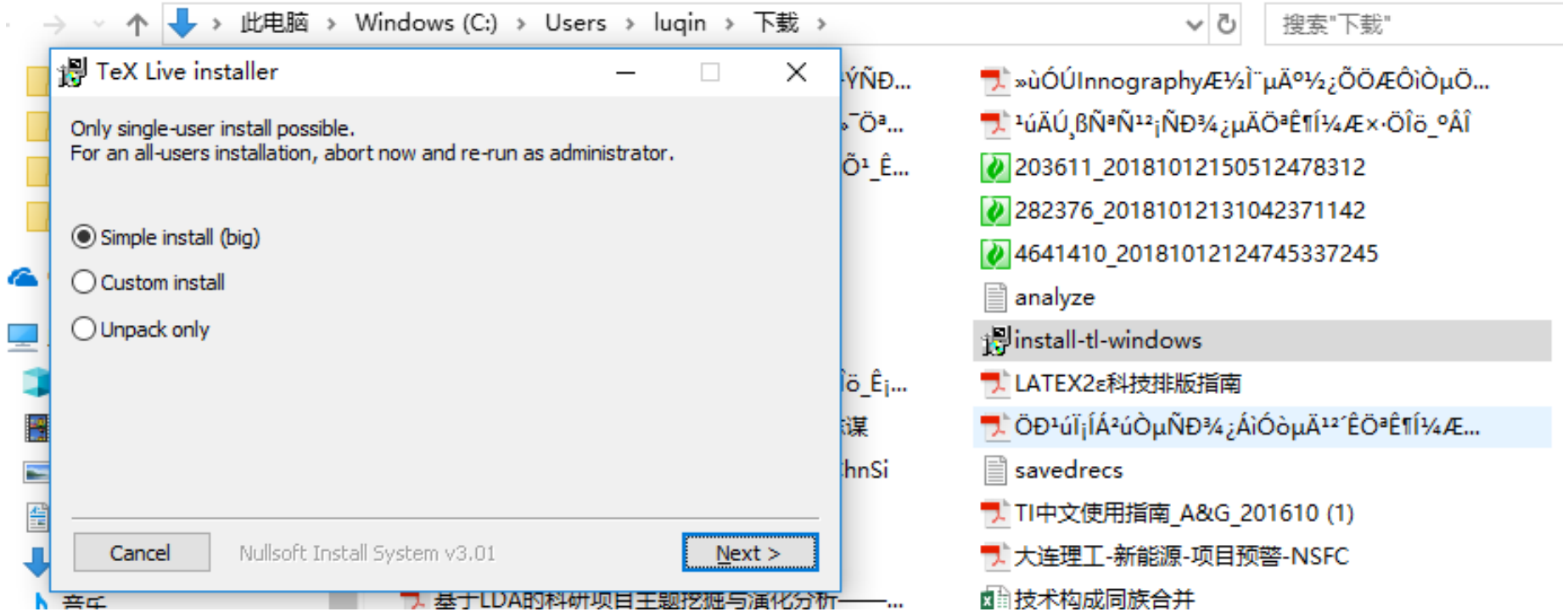
The above links use the generic mirror.ctan.org url which autoredirects to a CTAN mirror that should be reasonably nearby and reasonably up to date. However, perfect synchronization is not possible; if you have troubles following the links, your best bet is to choose explicitly from the list of CTAN mirrors (you'll need to append `systems/texlive/tlnet` to the top-level mirror urls given there to get to the TL area).

After unpacking the archive, change to the resulting `install-tl-*` subdirectory. Then follow the quick installation instructions or read the documentation.

If you need to download through proxies, use a `~/.wgetrc` file or environment variables with the proxy settings for wget. TeX Live always uses GNU wget to download.

With this network-based installation method, what gets installed is the currently available versions of packages and programs. This is in contrast with the other installation methods, which are kept stable between public releases.

Sources: the live network installation does not include the hundreds of megabytes of sources for the compiled programs. The sources for the current release are on CTAN, and historical releases are also available, and of course current development sources are in the repository.



- *Double click* install-tl-windows
- *Choose* Simple install

Install-tl

TeX Live 2018

TeX Live 2018安装 1/4

Welcome to the installation of TeX Live 2018
http://tug.org/texlive

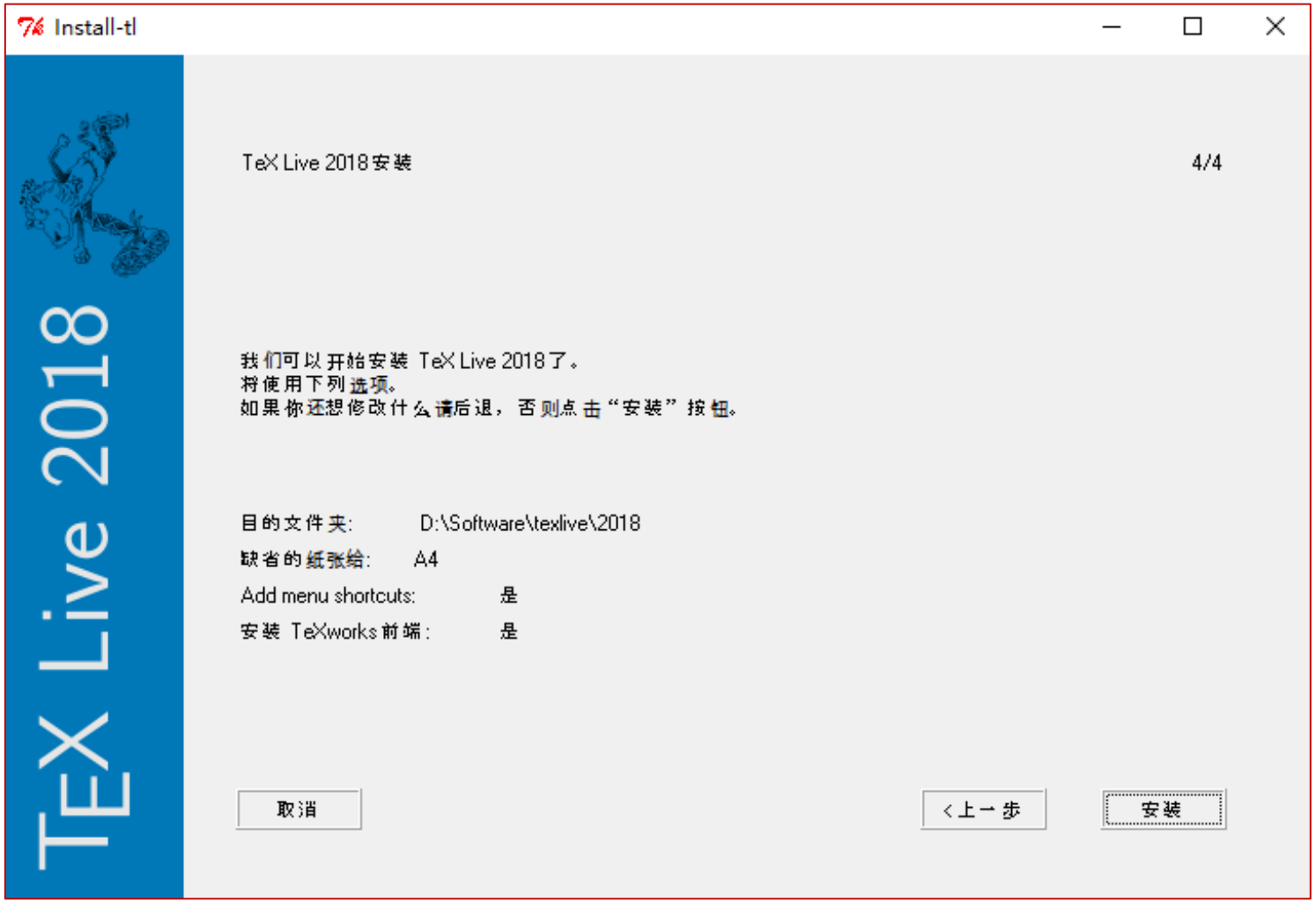
This wizard will guide you through the installation.

In case of trouble, try to disable your virus scanner during installation.

For an advanced, customizable installation, please consult
the web pages or installation guide.
Or use install-tl-advanced.bat.

☐ Change default repository

退出 下一步 >


Install-tl
TeX Live 2018
TeX Live 2018安装
4/4
我们可以开始安装 TeX Live 2018了。
将使用下列选项。
如果你还想修改什么请后退，否则点击“安装”按钮。
目的文件夹: D:\Software\texlive\2018
缺省的纸张给: A4
Add menu shortcuts: 是
安装 TeXworks 前端: 是
取消
<上一步
安装

Install-tl

安装过程

```
Installing [0116/3680, time/total: 01:40/49:54]: apalike2 [7k]
Installing [0117/3680, time/total: 01:40/49:54]: apnum [736k]
Installing [0118/3680, time/total: 01:41/50:00]: appendix [169k]
Installing [0119/3680, time/total: 01:41/49:55]: appendixnumberbeamer [3k]
Installing [0120/3680, time/total: 01:41/49:54]: apprends-latex [2432k]
Installing [0121/3680, time/total: 01:42/49:08]: apptools [87k]
Installing [0122/3680, time/total: 01:43/49:34]: apxproof [565k]
Installing [0123/3680, time/total: 01:43/49:17]: arabi [3811k]
Installing [0124/3680, time/total: 01:46/48:48]: arabi-add [168k]
Installing [0125/3680, time/total: 01:46/48:43]: arabluatex [796k]
Installing [0126/3680, time/total: 01:47/48:48]: arabtex [597k]
Installing [0127/3680, time/total: 01:48/48:58]: arabxetex [511k]
Installing [0128/3680, time/total: 01:49/49:11]: aramaic-serto [312k]
Installing [0129/3680, time/total: 01:50/49:29]: arara [6131k]
Installing [0130/3680, time/total: 01:54/48:24]: arara.win32 [1k]
Installing [0131/3680, time/total: 01:54/48:24]: archaeologie [1271k]
Installing [0132/3680, time/total: 01:55/48:16]: archaic [3372k]
```

取消

换为 SmartArt

加标题

al\Temp\nsqF094.tmp\install-tl-20181031\inst_

Cancel Nullsoft Install System v3.01 < Back Close

After the completion of installation of TeX Live, now your Start menu shows “Recently added”, including 5 programs:

- PS_View --- a viewer program for the PostScript format; you probably won’t need it
- TeXdoc GUI --- a graphical user interface offering access to a hug amount of LaTeX-related information.
- TeXworks editor --- an editor developed to create LaTeX documents comfortably. We will make extensive use of it.
- TeX Live Manager --- your tool for package management, for example, installation and update of LaTeX packages.
- DVIOUT DVI viewer --- a viewer program for the classic LaTeX output format DVI. Today, most people choose PDF output, so you probably won’t need it.

2. Build the structure of a paper

LaTeX statement

- When you write in LaTeX, every line is called a statement. There are three types of statements: command(命令), data(数据) and comment(注释).
- Two types of command: normal command(普通命令) and environment(环境environment). Normal command start with \, usually only one line; environment contains a pair of a start and an end, use in multiple lines cases. Command and environment can be used together.
- Data(数据) is the normal content that you write.
- Comment(注释) start with %, it will be neglected during the compilation.

The first document

first.tex - TeXworks

文件 编辑 搜索 格式 排版 脚本 窗口 帮助

pdfLaTeX

```
%our 1st doc
\documentclass{article}
\begin{document}
This is our first document.
\end{document}
```

first.pdf - TeXworks

文件 编辑 搜索 视图 排版 脚本 窗口 帮助

This is our first document.

Document structure

- LaTeX Source tex has three parts: Declaration of the document class(文档声明), preamble(序言), main text (正文)
- First assign with class the document is; then the preamble include some packages, [optional] define some command, set up environment; the real content is put in the main text.
- Main text refers to what is inside \begin{document} and \end{document}.

Basic grammar

```
\documentclass[options]{class} %文档类声明
\usepackage[options]{package} %引入宏包
...
\begin{document}                    %正文
...
\end{document}
```

Document classes

- article, letter, report, book are commonly used document class in LaTeX.
- Article class and letter have part, section and subsection, but no chapter， the abstract is followed the title on the first page
- Report class has part, chapter, section and subsection, has abstract and the abstract occupies a separate page with numbering.
- Book class has part, chapter, section, subsection, but no abstract.
- For conference or journal article, use class article or letter.
- For dissertation or thesis, use class report.

- Article, letter, report, book

Frequently used options

10pt, 11pt, 12pt	Main text font is default as 10pt. LaTeX use adjust the font for title, chapter heading and etc based on the main text font.
letterpaper, a4paper	Paper size， default is letter。
notitlepage, titlepage	Whether to start a new page after title. For article, default is notitlepage, for report and book, default is have titlepage。
onecolumn, twocolumn	Default is onecolumn except for book.

Title, author and date

```
\documentclass[a4paper,11pt]{article}
\begin{document}
\title{Example 2}
\author{My name}
\date{November 3, 2018}
\maketitle
\section{What's this?}
This is our second document. It contains a title and a section with text.
\end{document}
```

example2.tex

- Our document is of the type article. It will be printed on A4 paper using a size of 11 points for the base font.
- The title is “Example 2”.
- You are the author.
- The document is dated as November 3, 2018.

Example 2

My name

November 3, 2018

1 What’s this?

This is our second document. It contains a title and a section with text.

Abstract, section, subsection

Abstract environment:

```
\begin{abstract}
…
\end{abstract}
```

Title, author, date:

```
\title{the title}
\author{the author}
\today
\maketitle
```

Frequently used structural commands:

```
\chapter{…}
\section{…}
\subsection{…}
\subsubsection{…}
```

上海科技大学
ShanghaiTech University

Build the structure of a paper

```
\documentclass[11pt,a4paper]{article}

\begin{document}

\title{How to write a scientific paper using LaTeX}
\author{Your Name}
\maketitle

\begin{abstract}
This is the abstract. State the main points and highlights of your paper in a concise manner. References, figures, formulas and tables should not appear here.
\end{abstract}

\section{Introduction}
An introduction usually includes background, the problem to address, and the proposed solution. This section usually contains many references~\cite{ref1}.

\section{Methods and materials}
\subsection{Some fancy method}
One subsection.
\subsection{Some fancy materials}
Another subsection.

\section{Results and Discussion}
This is the results and discussion section.

\section{Conclusion}
Here is the conclusion.

\begin{thebibliography}{10}
\bibitem{ref1}
J.~R. Errington, P.~G. Debenedetti, and S.~Torquato, Phys. Rev. Lett. \textbf{89}, 215503 (2002).
\end{thebibliography}

\end{document}
```

Continue

StructurePaper.tex - TeXworks

文件 编辑 搜索 格式 排版 脚本 窗口 帮助

pdfLaTeX

```
\documentclass[11pt,a4paper]{article}
\begin{document}

\title{How to write a scientific paper using LaTeX}
\author{Your Name}
\maketitle

\begin{abstract}
\end{abstract}
This is the abstract. State the mainpoints and highlights of your paper here.
References, figures, formulas and tables should not appear in the abstract.

\section{Introduction}
An introduction usually includes background, the problem to address, and the
proposed solution. This section usually contains many references~\cite{ref1}.

\section{Methods and materials}
\subsection{Some fancy method}
One subsection.
\subsection{Some fancy materials}
Another subsection.

\section{Results and Discussion}
This is the results and discussion section.

\section{Conclusion}
Here is the conclusion.

\begin{thebibliography}{10}
\bibitem{ref1}
J.~R. Errington, P.~G. Debenedetti, and S.~Torquato, Phys. Rev. Lett.
\textbf{89}, 215503 (2002).
\end{thebibliography}

\end{document}
```

How to write a scientific paper using LaTeX

Your Name

November 7, 2018

Abstract

This is the abstract. State the mainpoints and highlights of your paper here. References, figures, formulas and tables should not appear in the abstract.

1 Introduction

An introduction usually includes background, the problem to address, and the proposed solution. This section usually contains many references [1].

2 Methods and materials

2.1 Some fancy method

One subsection.

2.2 Some fancy materials

Another subsection.

3 Results and Discussion

This is the results and discussion section.

4 Conclusion

Here is the conclusion.

References

[1] J. R. Errington, P. G. Debenedetti, and S. Torquato, Phys. Rev. Lett. **89**, 215503 (2002).

上海科技大学
ShanghaiTech University

3. Math in LaTeX

Math Mode

- Two types of Math Mode: inline and display
- inline: embed math expressions within text, use $...$
- display: display equations separated from the text, can be numbered or not numbered, use equation or equation* environment

```
\documentclass{article}
\usepackage[a6paper]{geometry}
\usepackage{amsmath}
\begin{document}
Average kinetic energy, $\langle
E_\textrm{kin}\rangle$, is related with the
number of particles and the temperature as
\begin{equation*}
\langle E_\textrm{kin}\rangle = \frac{3}{2}NkT
\end{equation*}

\begin{displaymath}
\langle E_\textrm{kin}\rangle = \frac{3}{2}NkT
\end{displaymath}

\begin{equation}
\langle E_\textrm{kin}\rangle = \frac{3}{2}NkT
\end{equation}

\end{document}
```

Average kinetic energy, $\langle E_\textrm{kin}\rangle$, is related with the number of particles and the temperature as

$$\langle E_\textrm{kin}\rangle = \frac{3}{2}NkT$$

$$\langle E_\textrm{kin}\rangle = \frac{3}{2}NkT$$

$$\langle E_\textrm{kin}\rangle = \frac{3}{2}NkT \qquad (1)$$

Basic elements: Greek letters

- Use commands below to enter Greek letters under math mode.

α	\alpha	θ	\theta	o	o	τ	\tau
β	\beta	ϑ	\vartheta	π	\pi	υ	\upsilon
γ	\gamma	ι	\iota	ϖ	\varpi	ϕ	\phi
δ	\delta	κ	\kappa	ρ	\rho	φ	\varphi
ϵ	\epsilon	λ	\lambda	ϱ	\varrho	χ	\chi
ε	\varepsilon	μ	\mu	σ	\sigma	ψ	\psi
ζ	\zeta	ν	\nu	ς	\varsigma	ω	\omega
η	\eta	ξ	\xi				
Γ	\Gamma	Λ	\Lambda	Σ	\Sigma	Ψ	\Psi
Δ	\Delta	Ξ	\Xi	Υ	\Upsilon	Ω	\Omega
Θ	\Theta	Π	\Pi	Φ	\Phi		

Basic elements:
fractions, subscripts, superscripts, roots

Fractions:
Within text, just write / to denote fractions, such as $(a+b)/2$. For larger fractions, use the \frac command:
\frac{numerator}{denumerator}

Subscripts and superscripts:
{expression}_{subscript}
{expression}^{superscript}
$x_1^2 + x_2^2 = 1$

Roots:
\sqrt{value}
For roots of higher order,
\sqrt[order]{value}

Operators

Some small operators can be directly entered, such as + - * /

```
\pm \times \div \cdot \cap \cup \geq
\leq \neq \approx \equiv
```

$$\pm \times \div \cdot \cap \cup \geq \leq \neq \approx \equiv$$

Summation, product, limit, integral use \sum \prod \lim \int \sum_{i=1}^n \prod_{i=1}^n \lim_{x\to0}x^2 \int_a^b x^2 dx

$$\sum_{i=1}^{n} \prod_{i=1}^{n} \lim_{x \to 0} x^2 \int_a^b x^2 dx$$

Commands for many common functions such as trigonometric functions, logarithm functions are predefined: \arccos, \arcsin, \arctan, \arg, \cos, \cosh, \cot, \coth, \exp, \inf, \lg, \ln, \log, \max, \min, \sin, \sinh, \tan, \tanh

For a complete list refer to Scott Pakin's 《The Comprehensive LaTex Symbol List》

Delimiters

- Delimiters include parentheses, brackets, and braces

```
() [] \{ \} \langle \rangle \lvert \rvert
```

$$()[]\{\}\langle\rangle|\,|$$

Before these delimiters, you can add commands to adjust the size, use \big \Big \bigg \Bigg

```
$\Bigg( \bigg(\Big( \big( () \big)\Big)\bigg)\Bigg)$
```

$$\Big(\big(\big((())\big)\big)\Big)$$

Arrows, accents, ellipsis

Arrows

$\leftarrow$	\leftarrow	$\longleftarrow$	\longleftarrow
$\rightarrow$	\rightarrow	$\longrightarrow$	\longrightarrow
$\leftrightarrow$	\leftrightarrow	$\longleftrightarrow$	\longleftrightarrow
$\Leftarrow$	\Leftarrow	$\Longleftarrow$	\Longleftarrow
$\Rightarrow$	\Rightarrow	$\Longrightarrow$	\Longrightarrow
$\Leftrightarrow$	\Leftrightarrow	$\Longleftrightarrow$	\Longleftrightarrow

Accents

$\acute{x}$	\acute{x}	$\tilde{x}$	\tilde{x}	$\mathring{x}$	\mathring{x}
$\grave{x}$	\grave{x}	$\breve{x}$	\breve{x}	$\dot{x}$	\dot{x}
$\bar{x}$	\bar{x}	$\check{x}$	\check{x}	$\ddot{x}$	\ddot{x}
$\vec{x}$	\vec{x}	$\hat{x}$	\hat{x}	$\dddot{x}$	\dddot{x}

ellipsis

\dots \cdots \vdots \ddots

$\dots$ $\cdots$ $\vdots$ $\ddots$

Matrix

Use environment array, {ccc} means center alignment, l, c, r represents left, center, right, respectively, \\ and & are to separate line and row.

```
\[\begin{array}{ccc}
x_1 & x_2 & \dots \\
x_3 & x_4 & \dots \\
\vdots & \vdots & \ddots \\
\end{array}\]
```

$$\begin{array}{ccc} x_1 & x_2 & \dots \\ x_3 & x_4 & \dots \\ \vdots & \vdots & \ddots \end{array}$$

Long formulas

For long formulas with multiple lines that don't need alignment, use environment *multiline*

```
\begin{multline}
x=a+b+c+\\
d+e+f+g
\end{multline}
```

$$x = a + b + c+ \\ d + e + f + g \quad (3.2)$$

For long formulas that need alignment, use environment *split*. But *split* environment needs to be inside math environment.

```
\[ \begin{split}
x=&a+b+c+\\
  &d+e+f+g
\end{split} \]
```

$$x =a + b + c+ \\ d + e + f + g$$

Pop Quiz 1

- Try to write this equation use what we have covered so far.

$$S(q) = 1 + 2\pi\rho \int_0^L r \left(\frac{\sin(qr)}{qr} \right) [g_{xy}(r) - 1] dr \qquad (1)$$

Answer

```
\documentclass{article}
\usepackage[a5paper]{geometry}
\usepackage{amsmath}
\begin{document}

\begin{equation}
 S(q)=1+2\pi \rho \int_0^L r\left(\frac{\sin(qr)}{qr} \right)[g_{xy}(r)-1]dr
\label{SQ}
\end{equation}

\end{document}
```

上海科技大学
ShanghaiTech University

4. Figures in LaTeX

Prepare the environment for figures

- Use package graphicx

  \usepackage{graphicx}
- Use environment figure

  \begin{figure}

  \end{figure}
- Use environment center

  \begin{center}

  \end{center}

Insert figures

- The most important command is \includegraphics

If the figure is in the same directory as your manuscript document, write
\includegraphics{figurename}

If the figure is in a different directory, specify a full or relative path name to the figure file
\includegraphics{path/figurename}

Don’t use blanks in the filename or path!
Blanks and special characters may cause problems with \includegraphics

You don’t need to specify a filename extension, it will be automatically detected.

Scale figures

- You can scale the figures as needed.
- The definition of includegraphics:

```
\includegraphics[key=value list]{filename}
```

Here are the most popular keys and how you can write the values.

- width : The graphic would be resized to this width. Example: width=0.9\textwidth
- height : The graphic would be resized to this height. Example: height=3cm.
- scale : The graphic would scale by this factor. Example: scale=0.5.
- angle : The graphic would be turned by this angle. Example: angle=90

Choose the optimal file type

- LaTeX support these files types:

  PNG, JPG, PDF and EPS

- PNG and JPG are bitmap formats, commonly used for photos. If you zoom in, you will notice a loss of quality.
- EPS and PDF are both vector graphics format. They are scalable, also looking good at high resolution or if you zoom in.
- Whenever possible, PDF or EPS should be preferred, for example, when you export drawings or diagrams out of other softwares such as Matlab.

An example

```
\documentclass[a4paper]{article}
\usepackage[english]{babel}
\usepackage{graphicx}

\begin{document}
\begin{figure}[ht]
\begin{center}
\includegraphics[width=0.7\textwidth]{curveline}
\end{center}
\caption{Some explanation about the figures.}
\label{curveline}
\end{figure}

\end{document}
```

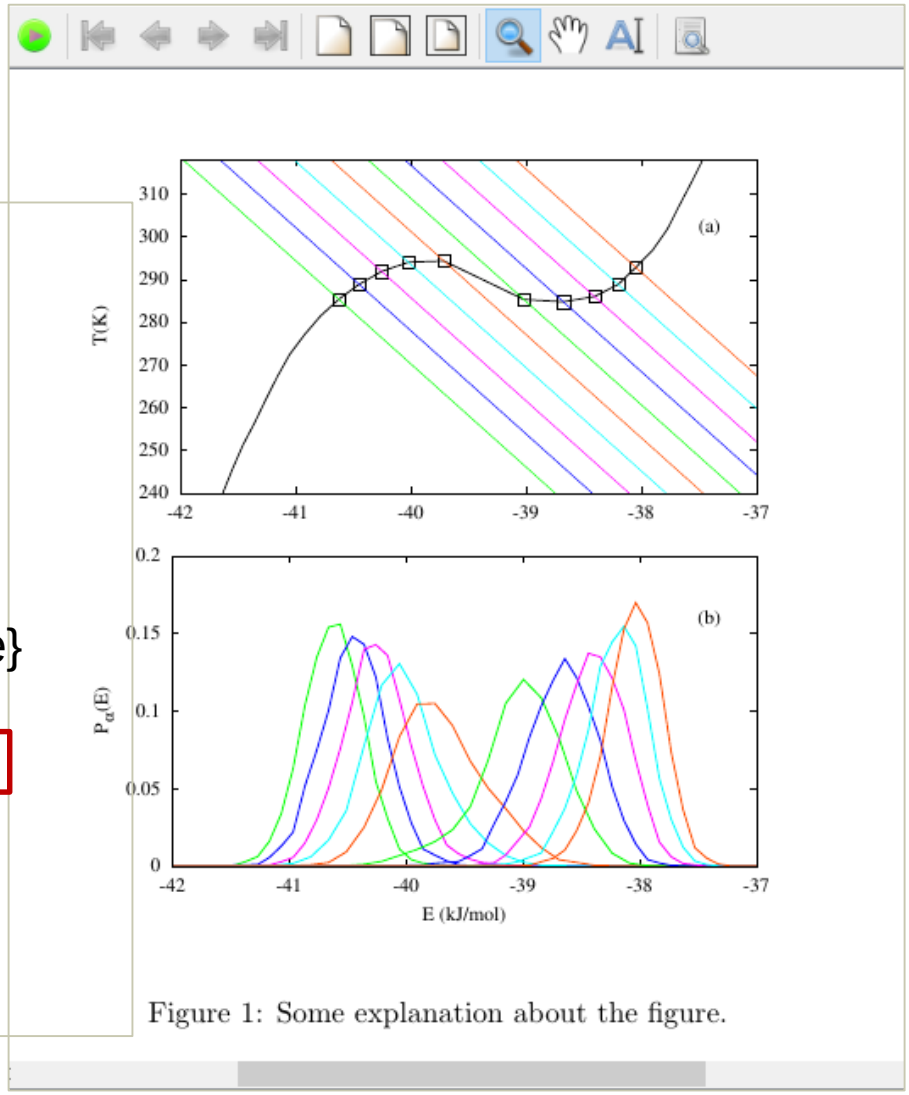


Figure 1: Some explanation about the figure.

Manage floating environment

- Figures often take much space, for the optimal page layout, LaTeX provides floating environment that takes an optional argument affecting the placement of the figure.

```
\begin{figure}[htbp]
\end{figure}
```

- h stands for here. The float may appear where it is been written in the source code.
- t stands for top. Placing at the top of a page is permitted.
- b stands for bottom. The float may appear at the bottom of a page.
- p stands for page. The float is allowed to appear on a separate page.

Using h alone is not recommended, LaTeX may not be happy.

上海科技大学
ShanghaiTech University

5. Creating Tables in LaTeX

Simple tables

- Use environment table
- Environment tabular enables simple tables
- Use \hline for a horizontal line, | for a vertical line and & to separate columns.
- Use \caption{} to write the caption
- Use \centering to put the table in the center
- Use \label after \end{tabular} to label this table
- Use options [htbp] for float environment

Example for a simple table

```
\documentclass[a4paper]{article}
\begin{document}
\begin{table}[ht]
\centering
\caption{This table lists the distributions and editors of LaTeX
that runs on different operation systems.}
\begin{tabular}{|l|c|r|}
\hline
Operation System & Distribution & Editor \\
\hline
Windows & MikTeX & TeXnicCenter\\
\hline
Unix/Linux & TeX Live & Kile \\
\hline
Mac OS & MacTeX & TeXShop\\
\hline
\end{tabular}
\label{Editors3}
\end{table}
\end{document}
```

Table 1: This table lists the distributions and editors of LaTeX that runs different operation systems.

Operation System	Distribution	Editor
Windows	MikTeX	TeXnicCenter
Unix/Linux	TeX Live	Kile
Mac OS	MacTeX	TeXShop

Three-line table

- Remove extra vertical and horizontal lines to create a three-line table

```
\begin{tabular}{|l|c|r|}
```

```
\begin{tabular}{lll}
```

Remove extra \hline

Table 1: This table lists the distributions and editors of LaTeX that runs on different operation systems.

Operation System	Distribution	Editor
Windows	MikTeX	TeXnicCenter
Unix/Linux	TeX Live	Kile
Mac OS	MacTeX	TeXShop

Change the table width

- Use the tabularx package to specify the table width

```
\usepackage{tabularx}
…
\begin{tabularx}{0.6\textwidth}{lcX}
…
\end{tabularx}
```

上海科技大学
ShanghaiTech University

6. Cross-Referencing in LaTeX

Cross Referencing

- As we write, we often need to refer to a certain point, such as section, subsection, figure, table or equation.

Equation

entropy estimate, $S(E)$, via ST-WHAM. Once the entropy is determined canonical thermodynamic properties including internal energy $E(T)$ and heat capacity $C_v(T)$, can be calculated as in Eq. (7) and (8). In contrast to the statistical tem-

Table

We also performed several gREM simulations at varied densities ρ with varying the system size $N = 256$, 576, and 800 (see Table 1 for the detailed description of systems),

Figure

System 1 through System 6 were illustrated in Figs. 4 (a) and 4 (b), respectively. Interestingly, it is that the drop in the inter-

Cross Referencing

- As we write, we often need to refer to a certain point, such as section, subsection, figure, table or equation.
- To be able to refer to a certain point, we have to mark it by a label. The name of that label will be used in cross referencing.
- Cross referencing will automatically track the number of the referred object using the label.
- This eliminates the errors of manually updating the numbering in the whole document, especially in a large document with many figures, equations, tables and etc.

Create cross-references

Create cross-references with two commands: \label{labelname} marks the element got referred, and \ref{labelname} prints the number of the element we refer to.

Equation

entropy estimate, $S(E)$, via ST-WHAM. Once the entropy is determined canonical thermodynamic properties including internal energy $E(T)$ and heat capacity $C_v(T)$, can be calculated as in Eq. (7) and (8). In contrast to the statistical tem-

```
\begin{equation}
C_v(T)=\frac{\langle E(T)^2\rangle-
\langle E(T)\rangle^2}{k_BT^2}.
\label{Cv}
\end{equation}
```

heat capacity $C_v(T)$, can be calculated as in Eq. (\ref{Cv}).

Figures, tables and etc

```
\begin{figure}[ht]
\begin{center}
\includegraphics[width=0.5\textwidth]{FigName}
\end{center}
\caption{Explain about the figure.}
\label{FigLabel}
\end{figure}
```

```
As shown in Fig. \ref{FigLabel}, …
```

```
\begin{table}[ht]
\centering
\caption{Some explanation}
\begin{tabular}{|l|c|r|}
…
\end{tabular}
\label{TabLabel}
\end{table}
```

```
The parameters are in Table \ref{TabLabel}
…
```

```
\section{Introduction}\label{sec:intro}
```

上海科技大学
ShanghaiTech University

7. Creating a bibliography in LaTeX

Use bibitem command

Create a tex file bibliography1.tex

```
\documentclass{article}
\begin{document}
\section*{Recommended texts}
To study $TeX$ in depth, see \cite{DK86}.
For writing math texts, see \cite{DK89}.
\begin{thebibliography}{8}
\bibitem{DK86} D.E. Knuth, \emph{The
{\TeX}book}, 1986
\bibitem{DK89} D.E. Knuth,
\emph{Typesetting Concrete Mathematics},
1989
\end{thebibliography}
\end{document}
```

Recommended texts

To study *TeX* in depth, see [1]. For writing math texts, see [2].

References

[1] D.E. Knuth, *The TEXbook*, 1986

[2] D.E. Knuth, *Typesetting Concrete Mathematics*, 1989

Typeset **twice** with pdfLaTeX

Use thebibligraphy environment

- LaTeX standard document provides environment thebiliography that uses the command \bibitem.
- The format is below:

```
\begin{thebibliography}{8}
\bibitem{somename1}
Information of this reference
\bibitem{somename2}
Information
…
\end{thebibliography}
```

In the main text, cite the reference as \cite{somename1, somename2,…}

Creating bibliography with BibTeX

- When the number of references are many, it is beneficial to use a database and call the external program BibTeX.
- You create a create a separate database file with the type .bib, and write the entries of the references in the following form.

```
@entrytype{keyword,
Fieldname = {field text},
Fieldname = {field text},
…
}
```

Entry for the fields in different types of references

Type	Required Fields	Optional Fields
@article	Author, title, journals, year	Volume, number, pages, month, note
@book	Author or editor, title, publisher, year	Volume, number, series, address, edition, month, note
@conference	Author, title, booktitle, year	Editor, volume or number, series, pages, address, month, organization, publisher, note
@materthesis	Author, title, school, year	Type, address, month, note
@phdthesis	Author, title, school, year	Type, address, month, note
@proceedings	Title, year	Editor, volume or number, series, address, month, organization, publisher, note

Create a new document ref.bib

```
@book{DK86,
author = "D.E. Knuth",
title = "The {\TeX}book",
publisher = "Addison Wesley",
year = 1986
}

@article{DK89,
author = "D.E. Knuth",
title = "Typesetting Concrete
Mathematics",
journal = "TUGboat",
volume = 10,
number = 1,
pages = "31--36",
month = apr,
year = 1989
}
```

main1.tex

```
\documentclass{article}
\begin{document}
\section*{Recommended texts}
To study $TeX$ in depth, see
\cite{DK86}. For writing math texts,
see \cite{DK89}.

\bibliographystyle{plain}
\bibliography{ref}
\end{document}
```

Compile

Compile main1.tex

1. pdfLaTeX
2. BibTeX
3. pdfLaTeX and pdfLaTeX (twice)

Recommended texts

To study *TeX* in depth, see [1]. For writing math texts, see [2].

References

[1] D.E. Knuth. *The TEXbook*. Addison Wesley, 1986.

[2] D.E. Knuth. Typesetting concrete mathematics. *TUGboat*, 10(1):31–36, April 1989.

上海科技大学
ShanghaiTech University

Download .bib file

THE JOURNAL OF PHYSICAL CHEMISTRY B

Search | Citation | Subject | Advanced Search

Enter search text / DOI | Anywhere | Search

J. Phys. Chem. B | All Publications/Website

Subscriber access provided by ShanghaiTech University

J. Phys. Chem.: A | B | C | Letters | Pre-1997

Browse the Journal | Articles ASAP | Current Issue | Submission & Review | Open Access | About the Journal

Customer Advisory

We are experiencing slow page load times due to a networking problem. We apologize for the inconvenience and are working to resolve this problem quickly.

Article

Previous Article | Next Article | Table of Contents

The Bend+Libration Combination Band Is an Intrinsic, Collective, and Strongly Solute-Dependent Reporter on the Hydrogen Bonding Network of Liquid Water

Pramod Kumar Verma[†⊥], Achintya Kundu[†§], Matthew S. Puretz[‡], Charvanaa Dhoonmoon[‡], Oriana S. Chegwidden[‡], Casey H. Londergan[*‡], and Minhaeng Cho[*†]

[†] Center for Molecular Spectroscopy and Dynamics, Institute for Basic Science (IBS), Department of Chemistry, Korea University, Seoul 02841, Republic of Korea

[‡] Department of Chemistry, Haverford College, 370 Lancaster Avenue, Haverford, Pennsylvania 19041, United States

J. Phys. Chem. B, **2018**, *122* (9), pp 2587–2599

DOI: 10.1021/acs.jpcb.7b09641

Publication Date (Web): November 2, 2017

Copyright © 2017 American Chemical Society

*E-mail: clonderg@haverford.edu., *E-mail: mcho@korea.ac.kr.

ACS Editors' Choice - This is an open access article published under an ACS AuthorChoice License,

Cite this: *J. Phys. Chem. B* 2018, 122, 9, 2587-2599

RIS Citation | GO

Article Options

ACS ActiveView PDF
Hi-Res Print, Annotate, Reference QuickView

PDF (2595 KB)

PDF w/ Links (520 KB)

Full Text HTML

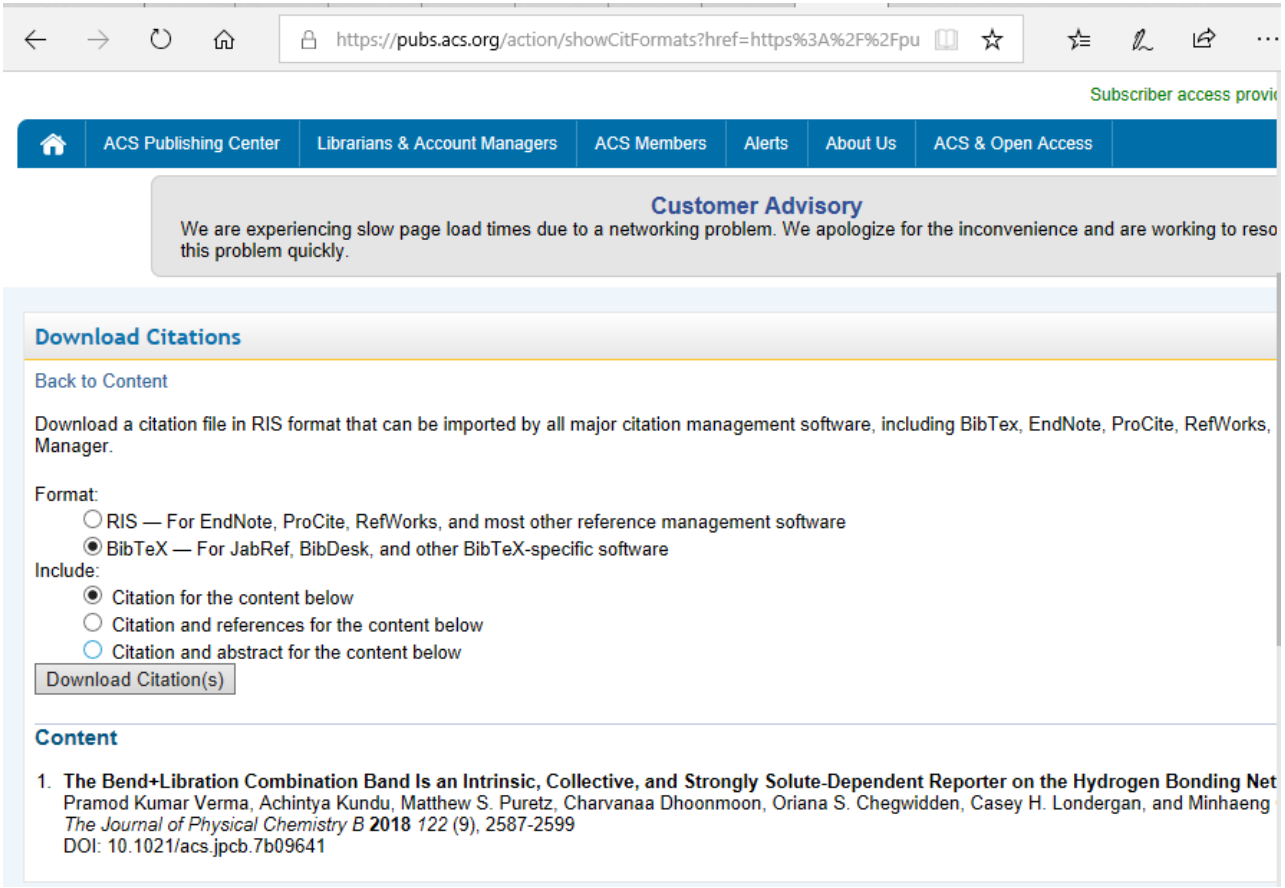
Abstract
Supporting Info
Figures
References
Citing Articles

Add to Favorites

Download Citation

上海科技大学
ShanghaiTech University

Download bib file



References:

- LaTeX Beginner's Guide, Stefan Kottwitz
- 论文排版实用教程——Word与LaTeX, 刘小平
- LaTeX 入门教程
  https://wenku.baidu.com/view/6e33321933687e21af45a9de.html?pn=51
- http://tex.stackexchange.com
- http://www.latex-community.org

上海科技大学
ShanghaiTech University

THANK YOU

Q&A