

A very brief introduction to LaTeX

LaTeX is not exactly a word processor in the traditional sense. When we use, for example, Google Docs or Microsoft Word, we see both the content of the document as well as its layout and formatting. This is sometimes called WYSIWYG — what you see is what you get. LaTeX is different: Instead of WYSIWYG, LaTeX operates with a “source code” view that consists of unformatted text and markup commands that tell LaTeX what to do with that text in your final, compiled document.

Let’s say you wanted to type the phrase “Hello world!” in a LaTeX document. In addition to typing “Hello world!”, you’d have to give LaTeX some instructions. A minimal example looks like this:

```
\documentclass{article}  
  
\begin{document}  
Hello world!  
\end{document}
```

Here I’m going to give you some instructions to get you started in LaTeX.

First, you need an editor and a compiler. Overleaf is an online editor and compiler and it is free. I’ll walk you through this one, you are free to use any other one.

1. Go to overleaf.com and create an account
2. Once you are logged in, click on “New project” and choose “Blank project”
3. Type

```
\documentclass[reprint,amsmath, amssymb, aps, prb]{revtex4-2}
```

This line will provide to your document with the layout of an American Journal of Physical paper.

4. We need to add some more lines to allow the use of math equations, graphs and symbols
`\usepackage{graphicx}% Include figure files
\usepackage{dcolumn}% Align table columns on decimal point
\usepackage{bm}% bold math`
5. Now, the document begins
`/begin{document}

/end {document}`
6. All your text will be written between these two lines.

```

\title{Schawlow's ruler}

\author{Josefa Guerrero Millan}
\affiliation{Department of Chemistry and Physics, Augusta University}

\author{My lab partner}
\affiliation{Department of Chemistry and Physics, Augusta University}

\date{\today} % It is always today but any date may be explicitly specified

```

The text after % is a comment and it will be ignored during compilation. Don't forget any brackets or \, this is like writing code, if something is missing, it won't work.

7. Now, the abstract

```

\begin{abstract}
This is my abstract, with my cool experiments and results
\end{abstract}

```

8. The title comes next,

```
\maketitle
```

9. Now, create as many sections as you need

```
\section{Introduction}
```

Bla bla bla

```
\section{Results}
```

...

10. Other things you need to know

a. Equations and symbols

There are two types of equation, the ones you write in-line with the text, like for example, *the speed of light is $c = 3 \cdot 10^8 \text{ m/s}$* . In this case, the equation is written between \$ signs, “/,” gives you a space between the 3 and the 10, “^” will make a superscript... you can explore this as you go.

The other type of equations are the ones that you write in a new line by itself. In that case, the equation will be written inside the environment *equation*.

```

\begin{equation}
\beta = \left( \frac{x^{2a}}{3-2y} \right)^{\alpha}
\end{equation}

```

$$\beta = \left(\frac{x^{2a}}{3 - 2y} \right)^\alpha$$

In addition, the equations will be numbered automatically. If you don't want them numbered, add an asterisk next to equation (equation*) when you create the environment.

b. How to insert figures and write captions

```
\begin{figure}
\includegraphics{fig_1}
\caption{\label{ZPDpicture}Write here your caption.}
\end{figure}
```

Some things to notice. `fig_1` can be jpg, eps,... don't write the extension here. It is good to write a label so in the text you can reference this figure easily. For example,

“As you can see in Fig. `\ref{ZPDpicture}`, the rings have almost disappeared...”

c. Tables

```
\begin{table}[b] %The best place to locate the table environment is directly after
  its first reference in text
\caption{\label{tab:table1}}
A table that fits into a single column of a two-column layout.
Note that REV\TeX~4 adjusts the intercolumn spacing so that the table fills the
entire width of the column. Table captions are numbered
automatically.
This table illustrates left-, center-, decimal- and right-aligned columns,
along with the use of the \texttt{ruledtabular} environment which sets the
Scotch (double) rules above and below the alignment, per APS style.
}
\begin{ruledtabular}
\begin{tabular}{l}
\text{Left}\footnote{Note a.} \\
\text{Centered}\footnote{Note b.} \\
\multicolumn{1}{c}{\text{Decimal}} \\
\text{Right} \\
\hline
1 & 2 & 3.001 & 4 \\
10 & 20 & 30 & 40 \\
100 & 200 & 300.0 & 400 \\
\end{tabular}
\end{ruledtabular}
\end{table}
```

TABLE I. A table that fits into a single column of a two-column layout. Note that REVTEX 4 adjusts the intercolumn spacing so that the table fills the entire width of the column. Table captions are numbered automatically. This table illustrates left-, center-, decimal- and right-aligned columns, along with the use of the `ruledtabular` environment which sets the Scotch (double) rules above and below the alignment, per APS style.

Left ^a	Centered ^b	Decimal	Right
1	2	3.001	4
10	20	30	40
100	200	300.0	400

^a Note a.

^b Note b.

d. References and Bibliography

I'll show you how to do this in a video.