

Quick Introduction to T_EX and L^AT_EX

Pinaki Bose
Linux User Group
University of Texas at Arlington

April 2, 2012

What is \LaTeX

- ▶ \LaTeX is a document markup language
- ▶ Pronounced Lay-Tech or Lah-Tech (not latex)
- ▶ Typeset using \TeX (written by Knuth)
- ▶ Best for typesetting math and documents
- ▶ Markup is plain text; can be piped around

A History of L^AT_EX

- ▶ T_EX written in 1970 by Donald Knuth
- ▶ Designed for making *pretty* documents
- ▶ For mathematics and engineering people
- ▶ L^AT_EX is a set of macros for T_EX
- ▶ Written in 1890's by Leslie Lamport

Things to do with L^AT_EX

- ▶ Type equations

```
\[ \imath\hbar\frac{\partial}{\partial t}\Psi(\vec{r},t)
= \frac{-\hbar^2}{2m}\nabla^2\Psi(\vec{r},t)
+ U(\vec{r},t)\Psi(\vec{r},t) \]
```

$$i\hbar\frac{\partial}{\partial t}\Psi(\vec{r},t) = \frac{-\hbar^2}{2m}\nabla^2\Psi(\vec{r},t) + U(\vec{r},t)\Psi(\vec{r},t)$$

- ▶ Write reports (examples)
- ▶ Make presentations (maybe)

Don't do with L^AT_EX

- ▶ Create posters/flyers (design work)
- ▶ Make diagrams/drawings (except with PSTricks)
- ▶ Both are possible; may not be good idea

Getting Started

- ▶ Start \LaTeX document with a `\documentclass`
- ▶ Visible markup goes inside document environment
- ▶ Stuff before document is the document “header”
- ▶ Header used for package imports and macro definitions
- ▶ Example document:

```
\documentclass{article}
\usepackage[version=3]{mhchem}
\def\hydronium{\ce{H3O+}}
\begin{document}
  Hello World! \\
  neat: \hydronium
\end{document}
```

Typesetting

- ▶ Lot like compiling a program
- ▶ Run file through `latex`
- ▶ Produces device-independent (DVI) file
- ▶ Use `dvips` or `dvipdf`
- ▶ Or just use `pdfLATEX`

Writing Math

▶ Inline mathematics: $\frac{1}{2} \int_0^\infty \psi^2(x) dx$

▶ Enclose in \$ signs; code for line above:

```
\frac{1}{2}\int_0^\infty\psi^2(x)dx
```

▶ displaystyle (block) mathematics mode

▶ Enclose in escaped brackets; typeset differently:

```
\[ \frac{1}{2}\int_0^\infty\psi^2(x)dx \]
```

$$\frac{1}{2} \int_0^\infty \psi^2(x) dx$$

▶ Another example: Schrödinger Equation from before