LaTeX Examples

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Here are examples of using LaTeX!

1 Basics

1.1 Paragraphs

This sentence is in the 1st paragraph. This sentence is also in the 1st paragraph.
This sentence is in the 2nd paragraph.

1.2 Special Characters

$ % & _ { }
~ # $ % ^ & _ { }
\

2 Typesetting

2.1 Line Breaking

This sentence is in the 1st line.
This sentence is in the 2nd line.
This sentence is in the 3rd line.

2.2 Page Breaking

This sentence is in the 1st page.

This sentence is in the 2nd page.

2.3 Quotation Marks

'Wrong' "Wrong"
'Right' "Right"

2.4 Dashes

X-ray
Page 0–65535
Yes—or no?
−2147483648

2.5 Tilde

This is not good.~
This is good!~

2.6 Degree Symbol

361°
−273.15°C (Better: −273.15 °C)
−273.15 °C = −459.67 °F

2.7 Ellipsis

This is not good...
This is good!...
This is also good!...

2.8 Special Letters

Hello everyone, I am Schrödinger, and here are my brothers: Schrȯdinger, Schrōdinger, Schrõdinger, Schrôdinger, Schródinger, Schròdinger, Schrŏdinger, Schrődinger and Schrŏdinger. Do you know about angstrom? Its symbol is Å.

2.9 The Space Between Words

Mr. An do not hate FORTRAN. However you may hate it. (Bad!)
Mr. An do not hate FORTRAN. However you may hate it. (Good!)

2.10 Cross References

A reference to this subsection looks like: "see subsection 2.10 on page 2."

2.11   Footnotes

Footnotes referring to a sentence or part of it should be put after the comma or period.[1]

2.12   Emphasized Words

emphasis emphasis <u>emphasis</u> emphasis emphasis
emphasis emphasis <u>emphasis</u> emphasis emphasis
emphasis emphasis *emphasis* emphasis emphasis
emphasis emphasis emphasis *emphasis emphasis*

2.13   Itemize

Here is an example of itemize:

- John Higgins

- Mark Williams

- Ronnie O'Sullivan

2.14   Enumerate

Here is an example of enumerate:

1. World Championship

2. UK Championship

3. Masters

2.15   Description

Here is an example of description:

Topspin striking the white ball above the midpoint of its vertical plane as it faces the shooter quickly, and after the white ball hits the colour ball, the included angle between the shift directions of two balls is less than 90°.

Stun striking the white ball at the midpoint of its vertical plane as it faces the shooter quickly, and after the white ball hits the colour ball, the included angle between the shift directions of two balls is nearly 90°.

Screw striking the white ball below the midpoint of its vertical plane as it faces the shooter quickly, and after the white ball hits the colour ball, the included angle between the shift directions of two balls is more than 90°.

---

[1]This is a footnote.

2.16 Quote

Here is an example of quote:

> ...lensed FRBs, as a powerful probe and completely independent dataset based on a different physical phenomenon, would provide complementary information and therefore are of vital importance to clarify the tension between the latest Planck-inferred H_0 and the one from direct local distance ladder observations.[2]

2.17 Abstract

Here is an example[3] of abstract:

Abstract

Fast radio bursts (FRBs) are millisecond-duration radio transients of unknown physical origin observed at extragalactic distances. It has long been speculated that magnetars are the engine powering repeating bursts from FRB sources, but no convincing evidence has been collected so far. Recently, the Galactic magnetar SRG 1935+2154 entered an active phase by emitting intense soft γ-ray bursts. One FRB-like event with two peaks (FRB 200428) and a luminosity slightly lower than the faintest extragalactic FRBs was detected from the source, in association with a soft γ-ray/hard-X-ray flare. Here we report an eight-hour targeted radio observational campaign comprising four sessions and assisted by multi-wavelength (optical and hard-X-ray) data. During the third session, 29 soft-γ-ray repeater (SGR) bursts were detected in γ-ray energies. Throughout the observing period, we detected no single dispersed pulsed emission coincident with the arrivals of SGR bursts, but unfortunately we were not observing when the FRB was detected. The non-detection places a fluence upper limit that is eight orders of magnitude lower than the fluence of FRB 200428. Our results suggest that FRB-SGR burst associations are rare. FRBs may be highly relativistic and geometrically beamed, or FRB-like events associated with SGR bursts may have narrow spectra and characteristic frequencies outside the observed band. It is also possible that the physical conditions required to achieve coherent radiation in SGR bursts are difficult to satisfy, and that only under extreme conditions could an FRB be associated with an SGR burst.

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[2]Li, ZX., Gao, H., Ding, XH. *et al.* Strongly lensed repeating fast radio bursts as precision probes of the universe. *Nat Commun* **9**, 3833 (2018).

[3]Lin, L., Zhang, C.F., Wang, P. *et al.* No pulsed radio emission during a bursting phase of a Galactic magnetar. *Nature* **587**, 63–65 (2020).

2.18   Printing Verbatim

```
program hellolatex
print *, "Hello, LaTeX!"
end program hellolatex
```

```
      PROGRAM HELLOLATEX
      PRINT *, 'HELLO, LATEX.'
      END PROGRAM HELLOLATEX
```

The last line of the program can also be `end` (or `      END`).

2.19   Table

Year	Jan.	Mar.	May	July	Sept.	Nov.
2002						★
2003	★		★		★	
2004	★	★	★	★		★
2005	★	★	★	★	★	★
2006		★		★	★	★
2007	★			★		
2008		★				
2009	★				★	
2010	★					

Table 1: Top Division Champion Record of Asashōryū Akinori

2.20   Figure

Figure 1: Hakuhō Shō

3 Typesetting Mathematical Formulae

3.1 Single Euations

Show equation $E = mc^1$ in display style:

$$E = mc^1.$$

Show equation $E = mc^2$ in display style with a tag:

$$E = mc^2. \tag{1}$$

Show equation $E = mc^3$ in display style with a specific tag:

$$E = mc^3. \tag{$*$}$$

Equation (1) is right, while equation ($*$) is wrong!

3.2 Texts

This is wrong:
$$x > 0 for all x \in R_+.$$

This is right:
$$x > 0 \qquad \text{for all } x \in \mathbb{R}_+.$$

3.3 Superscripts and Subscripts

$\sum_{i=1}^{100} i = \sum_{j=1}^{100} j$. $a^x + y \neq a^{x+y}$. $e^{x^2} \neq e^{x2}$.

3.4 Root Signs

$\sqrt{5} > \sqrt[5]{5}$.

3.5 Names of Functions

This is wrong: $2 lim_{x \to \infty} arctan x = \pi$.
This is right: $2 \lim_{x \to \infty} \arctan x = \pi$.

3.6 Modulo

$5 \bmod 2 = 1$, $5 \equiv 1 \pmod 2$.

3.7 Fraction

$\frac{\mathrm{d}^n y}{\mathrm{d}x^n}$. $\frac{\partial^2 z}{\partial x \partial y}$.

3.8 Binomial Coefficient

$\binom{n}{k} = \binom{n-1}{k} + \binom{n-1}{k-1}$.

3.9 Stacking Symbols
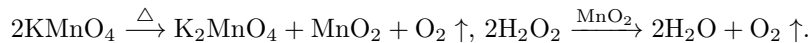
$2\mathrm{KMnO_4} \xrightarrow{\triangle} \mathrm{K_2MnO_4} + \mathrm{MnO_2} + \mathrm{O_2} \uparrow$, $2\mathrm{H_2O_2} \xrightarrow{\mathrm{MnO_2}} 2\mathrm{H_2O} + \mathrm{O_2} \uparrow$.
The second one is better!
Math is much more complex than chemistry:

$$\sum_{\substack{1 \le i \le n \\ j > i}} l_{ij}^2 = 0.$$

3.10 Aligning

$$\nabla \frac{1}{r} = \nabla \frac{1}{\sqrt{x^2 + y^2 + z^2}} \tag{2}$$
$$= -\frac{x\boldsymbol{i} + y\boldsymbol{j} + z\boldsymbol{k}}{\sqrt{x^2 + y^2 + z^2}^3}$$
$$= -\frac{\hat{\boldsymbol{r}}}{r^2}. \tag{$\star$}$$

(2) can be derived by definition, and the result ($\star$) is beautiful!

3.11 Matrices

$$\boldsymbol{I} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}.$$

3.12 Piecewise Functions

$$|x| = \begin{cases} -x & \text{if } x < 0, \\ 0 & \text{if } x = 0, \\ x & \text{if } x > 0. \end{cases}$$

3.13 Spacing

This is a space.
This is 3/18 quad.
This is 3/18 quad.
This is 4/18 quad.
This is 5/18 quad.
This is   1 quad.
This is   2 quads.

3.14 Phantoms

This is wrong: $_{9}^{99}\mathrm{C}R_{abc}^{d}$.
This is also wrong: $_{9}^{99}\mathrm{C}R_{abc}{}^{d}$.
This is right: $_{9}^{99}\mathrm{C}R_{abc}{}^{d}$.

3.15   List of Symbols

See [The Comprehensive LATEX Symbol List](#) for many many symbols!

$$\dot{a} \quad \texttt{\textbackslash dot\{a\}} \quad \bar{a} \quad \texttt{\textbackslash bar\{a\}} \quad \hat{a} \quad \texttt{\textbackslash hat\{a\}}$$
$$\ddot{a} \quad \texttt{\textbackslash ddot\{a\}} \quad \vec{a} \quad \texttt{\textbackslash vec\{a\}}$$

$<$	`<`	$>$	`>`	$=$	`=`
$\leq$	`\leq`	$\geq$	`\geq`	$\equiv$	`\equiv`
$\ll$	`\ll`	$\gg$	`\gg`		
$\in$	`\in`	$\ni$	`\ni`	$\sim$	`\sim`
$\subset$	`\subset`	$\supset$	`\supset`	$\simeq$	`\simeq`
$\subseteq$	`\subseteq`	$\supseteq$	`\supseteq`	$\approx$	`\approx`
$:$	`:`	$\mid$	`\mid`	$\propto$	`\propto`
$\perp$	`\perp`	$\parallel$	`\parallel`		
$\notin$	`\not\in`	$\not\ni$	`\not\ni`	$\neq$	`\neq`
$\not\subset$	`\not\subset`	$\not\supset$	`\not\supset`	$\not\equiv$	`\not\equiv`
$\nsubseteq$	`\not\subseteq`	$\nsupseteq$	`\not\supseteq`		

$+$	`+`	$-$	`-`	$\times$	`\times`	$\div$	`\div`
$\pm$	`\pm`	$\mp$	`\mp`	$\cdot$	`\cdot`	$/$	`/`
$\cup$	`\cup`	$\cap$	`\cap`	$\oplus$	`\oplus`	$\otimes$	`\otimes`
$\star$	`\star`	$\ast$	`\ast`	$\dagger$	`\dagger`	$\ddagger$	`\ddagger`

$\sum$	`\sum`	$\prod$	`\prod`	$\bigcup$	`\bigcup`	$\bigcap$	`\bigcap`
$\int$	`\int`	$\oint$	`\oint`	$\bigoplus$	`\bigoplus`	$\bigotimes$	`\bigotimes`

$\leftarrow$	`\leftarrow`	$\longleftarrow$	`\longleftarrow`
$\rightarrow$	`\rightarrow`	$\longrightarrow$	`\longrightarrow`
$\leftrightarrow$	`\leftrightarrow`	$\longleftrightarrow$	`\longleftrightarrow`
$\Leftarrow$	`\Leftarrow`	$\Longleftarrow$	`\Longleftarrow`
$\Rightarrow$	`\Rightarrow`	$\Longrightarrow$	`\Longrightarrow`
$\Leftrightarrow$	`\Leftrightarrow`	$\Longleftrightarrow$	`\Longleftrightarrow`
$\mapsto$	`\mapsto`	$\longmapsto$	`\longmapsto`
$\uparrow$	`\uparrow`	$\downarrow$	`\downarrow`

$\overleftarrow{AB}$	`\overleftarrow{AB}`	$\underleftarrow{AB}$	`\underleftarrow{AB}`
$\overrightarrow{AB}$	`\overrightarrow{AB}`	$\underrightarrow{AB}$	`\underrightarrow{AB}`
$\overleftrightarrow{AB}$	`\overleftrightarrow{AB}`	$\underleftrightarrow{AB}$	`\underleftrightarrow{AB}`

(a)	`(a)`	$[a]$	`[a]`
$\{a\}$	`\{a\}`	$\langle a\rangle$	`\langle{a}\rangle`
$\lfloor a\rfloor$	`\lfloor{a}\rfloor`	$\lceil a\rceil$	`\lceil{a}\rceil`
$\lvert a\rvert$	`\lvert{a}\rvert`	$\lVert a\rVert$	`\lVert{a}\rVert`

$\ldots$	`\ldots`	$\cdots$	`\cdots`	$\vdots$	`\vdots`	$\ddots$	`\ddots`
$\because$	`\because`	$\therefore$	`\therefore`	∞	`\infty`	$\%$	`\%`
∇	`\nebla`	$\angle$	`\angle`	$\square$	`\square`	$\varnothing$	`\varnothing`
$\hbar$	`\hbar`	ℓ	`\ell`	$\Re$	`\Re`	$\Im$	`\Im`
$\forall$	`\forall`	$\exists$	`\exists`	$\aleph$	`\aleph`	∂	`\partial`
$\S$	`\S`	$\P$	`\P`

4 Bibliography

Fast radio bursts (FRBs) are millisecond-duration bright radio transients [1, 2].

References

[1] Z.-X. Li, H. Gao, X.-H. Ding, G.-J. Wang, and B. Zhang. Strongly lensed repeating fast radio bursts as precision probes of the universe. *Nature Communications*, 9:3833, Sept. 2018.

[2] L. Lin, C. F. Zhang, P. Wang, H. Gao, X. Guan, J. L. Han, J. C. Jiang, P. Jiang, K. J. Lee, D. Li, Y. P. Men, C. C. Miao, C. H. Niu, J. R. Niu, C. Sun, B. J. Wang, Z. L. Wang, H. Xu, J. L. Xu, J. W. Xu, Y. H. Yang, Y. P. Yang, W. Yu, B. Zhang, B.-B. Zhang, D. J. Zhou, W. W. Zhu, A. J. Castro-Tirado, Z. G. Dai, M. Y. Ge, Y. D. Hu, C. K. Li, Y. Li, Z. Li, E. W. Liang, S. M. Jia, R. Querel, L. Shao, F. Y. Wang, X. G. Wang, X. F. Wu, S. L. Xiong, R. X. Xu, Y.-S. Yang, G. Q. Zhang, S. N. Zhang, T. C. Zheng, and J.-H. Zou. No pulsed radio emission during a bursting phase of a Galactic magnetar. *Nature*, 587:63–65, Nov. 2020.

5 New Commands

Lshort is good!
Lnotes is also good!

6 Hypertext Links

Want to make *LATEX Examples* better?
Start pull requests or issues on Github, or send emails to Gasin185@163.com!