






# Papermaker: an attempt at frictionless typesetting of publication-ready scientific articles

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Papermaker is an open-source tool aiming to typeset professional-quality scientific articles from mostly-Markdown sources, retaining the option to use LaTeX where finer control is needed. It supports strict separation of content and formatting; numbered or unnumbered equations and inline mathematical expressions; automatic numbering of sections; floating, automatically-numbered figures and tables; text references to sections, page numbers, figures and tables; BibTeX citations; automatic text substitutions and custom commands.

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## 1 Design goals and philosophy

- separate content (source files) and formatting (template)
- use Markdown format by default, keeping the option to use LaTeX whenever needed
- define metadata (title, authors, affiliations...) only once, all in a single `toml` file
- use LaTeX for inline math expressions and numbered or unnumbered equations
- use simple 'toml' syntax to specify floating figures and tables
- use LaTeX syntax for referencing figures, tables, sections or page numbers
- insert in-text citations defined in a separate BibTeX file, with the list of references being generated automatically
- optionally define custom LaTeX commands and/or document-wide text substitutions

The core idea behind `papermaker` is that *writing* LaTeX is not particularly hard using modern implementations like XeLaTeX, which use UTF-8 encoding by default. It is usually much more challenging/time-consuming to fine-tune the final document's format by fiddling with the LaTeX source. On the other hand, it is much easier to share/re-use text writtent in Markdown than LaTeX. `papermaker` thus uses Markdown by default, keeping the considerable power of LaTeX available where needed, and hides the complex LaTeX syntax for important constructs such as floating figures behind a simpler `toml` syntax.

## 2 Installation and usage

This is an early-stage work in progress. For now, you need to install a LaTeX distribution and the other dependencies are handled by [pixi](#).

- Install [TeX Live](#) (on a Mac, your best option is [MacTeX](#))
- Install `pixi` (instructions [here](#))
- From `papermaker`'s root directory, `pixi run build` should process your paper, installing the required dependencies as needed in the rist run.

- When building an article, `papermaker` looks for source files in `src`, and the output is saved to `build`.

```
[figure]
foo
bar
```

## 3 Source files

### 3.1 Metadata

Metadata such as authors' names, emails, ORCIDs, institutions, or the article's title, are defined in `src/metadata.toml`.

```
title = 'The title of the paper'

[[author]]
name = 'J. Smith'
affiliations = 'USS'
email = 'john.smith@server.net'
orcid = '0000-0000-000-000'
corresponding = true

[[author]]
name = 'J. Doe'
affiliations = ['AFA', 'USS']
email = 'jane.doe@server.net'

[affiliations]
USS = "University of Scientific Studies"
AFA = "Academy of the Fine Arts"
```

### 3.2 Text

The body of the article is typeset based on the contents of `src/body.md`. Other parts of the document are from `src/abstract.md`, `src/contributions.md`, `src/acknowledgements.md`, and `src/reproducibility.md`.

### 3.3 Figures

```
[figure]
foo
bar
```

Figures are stored in `src/figures`. Each figure is defined by two files:

- a single PDF file, with a `.pdf` extension, corresponding to the contents of the figure (e.g., a picture or a plot)
- a single Markdown file, with a `.md` extension, corresponding to the caption for this figure.

For example, `src/figures` may contain:

```
src
└─ figures
   ├── age-plot.md
   ├── age-plot.pdf
   ├── field-photos.md
   └─ field-photos.md
```

In `src/body.md`, you may insert a figure such as fig. 1 using simple `toml` syntax:

```
%%% figure
name = 'field-photos'
label = 'fig:field-photos'
%%% end-figure
```

The `toml` block must start with `%%% figure` and end with `%%% end-figure`. The `name` attribute is mandatory and must correspond to a pair of files in `src/figures`. Other possible attributes are:

- `label`: used to reference the figure number elsewhere in the text: `Fig. \ref{fig:field-photos}` will be typeset as “Fig. 1”.
- `width`
- `height`
- `position`
- `sidecaption`
- `sidecaptionwidth`

## 4 Custom commands

You may define  $\LaTeX$  commands at the top of this source file using `\newcommand{}`:

```
\newcommand{\foo}{FOO}
\newcommand{\degC}[1]{\,^{\circ}\text{C}}
```

Thereafter, `\foo{}` in the source will be typeset as FOO and `37.2\degC{}` as 37.2 °C.



**Figure 1 – Example of a floating figure:** (A) Typical cobble sampled on Zalqa fan; (B) surface and depth profile on Aajâqa fan. Original figure from Daëron *et al.* [1].

## 5 Citations

You may cite references defined in the BibTeX file `src/refs.bib` using the following commands.

Pretium aenean pharetra magna ac placerat vestibulum lectus mauris. Scelerisque varius morbi enim nunc [2]. In vitae turpis massa sed elementum tempus. Et magnis dis parturient montes nascetur. Blandit libero volutpat sed cras ornare arcu dui vivamus. Urna neque viverra justo nec ultrices dui sapien. Purus in mollis nunc sed id semper. Auctor augue mauris augue neque gravida in fermentum et sollicitudin. Fringilla ut morbi tincidunt augue. Nunc mi ipsum faucibus vitae aliquet nec ullamcorper sit. Morbi tincidunt ornare massa eget egestas purus viverra Coogan *et al.* [3].

## 6 Methods

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```
import foo
print(foo.bar)
```

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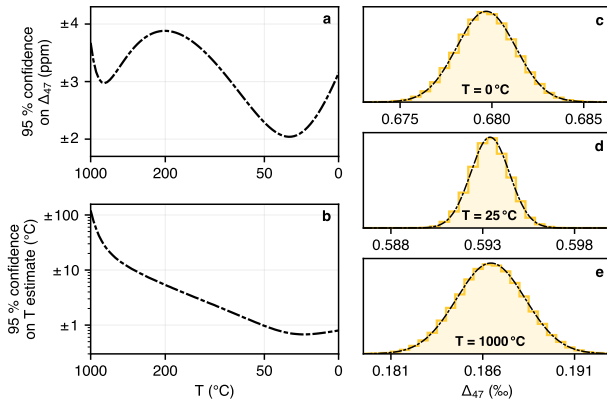
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## 7 Results

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| Foo  | Bar  | Baz  |
|------|------|------|
| 1    | 1    | a    |
| 22   | 10   | ab   |
| 333  | 100  | abc  |
| 4444 | 1000 | abcd |

**Table 1** –  $\LaTeX$  Table: this is a table generated from  $\LaTeX$  source code.



**Figure 2 – Lorem ipsum dolor sit amet:** Consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Vitae elementum curabitur vitae nunc. Nunc lobortis mattis aliquam faucibus. Orci sagittis eu volutpat odio. Lobortis scelerisque fermentum dui faucibus in ornare quam viverra orci. Vitae congue eu consequat ac felis donec. Quis risus sed vulputate odio ut enim. Pellentesque pulvinar pellentesque habitant morbi tristique senectus et. Arcu dictum varius duis at consectetur lorem. Fermentum dui faucibus in ornare.

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$$\sigma = \sum_i 4 \cdot \alpha_i^2 \quad (1)$$

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| Label     | Original publication      | Laboratory         | Sample Type           | N   | T (°C)     |
|-----------|---------------------------|--------------------|-----------------------|-----|------------|
| [B18]     | Breitenbach et al. [2018] | Univ. Cambridge    | Cave pearls           | 6   | 3 – 47     |
| [P18]     | Peral et al. [2018]       | LSCE               | Planktic foraminifera | 25  | 3 – 23     |
| [J20]     | Jautzy et al. [2020]      | Geol. Surv. Canada | Synthetic             | 11  | 5 – 250    |
|           |                           |                    | Heated                | 1   | 727        |
|           |                           |                    | Synthetic             | 17  | 6 – 80     |
|           |                           |                    | Tufa, Travertines     | 12  | 5 – 95     |
| [A21·MIT] | Anderson et al. [2021]    | MIT                | Lacustrine            | 6   | 0 – 4      |
|           |                           |                    | (Proto-)dolomite      | 4   | 80 – 350   |
|           |                           |                    | Heated                | 2   | 1100       |
|           |                           |                    | Slow-growing calcite  | 2   | 8 – 34     |
| [F21]     | Fiebig et al. [2021]      | Goethe-Univ.       | Synthetic             | 5   | 120 – 250  |
|           |                           |                    | Slow-growing calcite  | 3   | 8 – 34     |
|           |                           |                    | Heated                | 3   | 727 – 1100 |
| [H22]     | Huyghe et al. [2022]      | LSCE               | Marine bivalves       | 7   | –2 – 27    |
| [OGLS23]  | this study                | all of the above   | all of the above      | 104 | –2 – 1100  |

**Table 2 – PDF Table:** this is a table provided as a PDF by an external piece of software.

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## 8 Discussion

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## 9 Conclusion

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## Acknowledgements

Foo bar baz.

## Author contributions

MD wrote everything. KM, PMBH and MGS, being entirely fictional characters, did not contribute anything but recreative humor.

## Reproducible research

Foo bar baz.

## References

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- [4] L. A. Coogan & K. M. Gillis. Low-Temperature Alteration of the Seafloor: Impacts on Ocean Chemistry. *Annual Review of Earth and Planetary Sciences* 46:(1) (2018), pp. 21–45. [10.1146/annurev-earth-082517-010027](#).