

BibLaTeX: Bibliographies in LaTeX

Ricky Patterson

ricky@virginia.edu

Research Data Services



Bibliography - Questions

- How do you produce a bibliography for a paper
- How do you refer to cited works within the text of a paper
- How do you track references to be used in future papers

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● How do you produce a bibliography for a paper

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GILBERT ET AL.

and in fact makes the observed gradient in the inner ~ 30 kpc more pronounced.

The 37 lines of sight analyzed here are spread throughout three quadrants of M31's halo and over a radial range of 9–177 kpc, and include over 1500 spectroscopically confirmed M31 halo stars. This is the most radially extended M31 halo metallicity study to date, presenting over a factor of two increase in data compared to previous studies based on spectroscopically confirmed M31 stars. Careful spectroscopic selection significantly decreases the contamination rate of MW stars in the sample, something that is a struggle for purely photometric studies that must statistically subtract a MW foreground population (e.g., Richardson et al. 2009) or significantly restrict the color range of stars to limit contamination (e.g., Tanaka et al. 2010; Ibata et al. 2014). In the low density regions of M31's outer halo, MW foreground stars greatly outnumber M31 RGB stars, thus the ability to identify M31 stars is paramount for studies of the extended regions of M31's halo.

The metallicity profile of M31's stellar halo is largely consistent with the results of the most recent simulations of stellar halo formation, which include baryonic processes and produce a stellar halo composed both of accreted stars and stars formed in the host galaxy. In the simulations, a large-scale gradient of the magnitude and radial range seen in M31's halo is most likely to form from the accretion of relatively massive progenitors. However, the field to field variation seen in both the surface brightness and metallicity profiles indicate that multiple smaller progenitors are also likely to have contributed substantially to the outermost regions of M31's halo.

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We can easily estimate the effect removal of these stars has on the measured gradient by including these stars in our estimates of the median $[\text{Fe}/\text{H}]$ in each field (assigning them a value of $[\text{Fe}/\text{H}] = -2.3$) and measuring the gradient using these median field values. The resulting gradients are $-0.011 \pm 0.0007 \text{ dex kpc}^{-1}$ for all M31 stars and $-0.0105 \pm 0.0013 \text{ dex kpc}^{-1}$ when tidal debris features are removed, each of which are fully consistent with the slopes found when stars bluer than the isochrones are excluded. We therefore conclude that removal of the M31 stars bluer than the isochrone grid is not significantly biasing our results.

stellar halo follows a different density profile in the inner regions than the dominant, metal-rich population (Williams et al., in preparation). This interpretation is consistent with the different power-law indices measured for metal-rich and metal-poor stars in the outer regions by Ibata et al. (2014). It is also similar to the differences between inner and outer halo populations in the MW inferred from the work of Carollo et al. (2010), An et al. (2013) and Allende Prieto et al. (2014).

However, the Dorman et al. (2012) sample is interior to the majority of the Chapman et al. (2006) fields, as well as the fields presented here. We thus do not know if the rotation

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RefWorks

zotero



MENDELEY

THOMSON REUTERS

ENDNOTE



LaTeX

- LaTeX offers solutions to all three of these problems.
- There are several solutions
 - BibTeX and natbib (widely used, no longer developed)
 - Biber and BibLaTeX (the future)

But first: `{thebibliography}` `\cite` `\bibitem`

- How native LaTeX deals with bibliographies...
- You generate the bibliography for a paper with `\begin{thebibliography}`
- Each entry in the bibliography is generated by a `\bibitem` entry (just a special type of `\item`)
- Each citation in the text itself is generated by a `\cite` command (which looks for a matching `\bibitem`)
- <http://bit.ly/latexbib1native>

BibTeX

- Refers to both the file format and the tool used to describe and process lists of references
- The bibliography is kept in a separate file (.bib)
 - Can contain references that aren't cited in a paper; only the cited papers will be listed in the bibliography created for that paper
 - Format is very particular, but it is easy to generate
 - Still use `\cite` within the LaTeX document
- A bibliography style file controls the format of the bibliography

BibTeX file

- Can generate a .bib file by hand but is very tedious.
- Composed of records (@) with many fields per record:
 - @conference{taiwan2000,
 - author = "Richard J. Patterson",
- Many databases can export a citation in BibTeX format (Web of Science, Google Scholar, etc.)
- Most citation managers can generate a BibTeX formatted file from list of references (Refworks)

BibTeX style files

- Analogous to the “class” files in LaTeX
- Specified by `\bibliographystyle{filename}`
 - Looks for `filename.bst`
- A number of style files are part of the default TeX distribution, including `plain.bst`
- Changes the appearance of the bibliography and the in-text citations
- Publishers generally have their own `bst` files, which you should make use of.
- You could design your own, but is it worth it?

natbib

- Automatic numbering, sorting and formatting of in text citations and bibliographic references
- Supports numeric and author-year citation
- `\citet` and `\citep` for in-text and () citations.
- <http://bit.ly/latexbib2natbib>
 - Look at `example.bib` as well as `main.tex` – you need to clone the project to see `example.bib` a BibTeX file.
 - `natbib` can work in a limited way with `\bibitem` instead of `.bib` file

- natbib can work in a limited way with `\bibitem` instead of `.bib` file – can be used apart from BibTeX
- natbib: “nat” = “Natural Sciences” but it is flexible and supports many citation styles
- Alternatives to natbib include:
 - jurabib (primarily for the humanities and legal studies). Features include specifying editors in a commentary & cross references to other footnotes.

Biber and BibLaTeX

- Many people use BibTeX and natbib, but these packages are no longer actively supported, and you will see a change as journals shift to the newer tools
- biber is the new parser for .bib files (replacement for BibTeX)
- bibLaTeX is a redesign of how LaTeX handles citations, formatting is now controlled by LaTeX macros. Much more powerful than previous either the native cite or natbib/BibTeX.

Bibliographies in LaTeX

- You can create simple ones within basic LaTeX.
- BibTeX refers to both a file format (.bib file) as well as a program which runs externally to LaTeX itself to process the references in a document. Limited to the ASCII character set.
- natbib is a LaTeX package which allows customization of citation styles (especially author-year format), but still makes use of BibTeX.
- BibLaTeX is a LaTeX package which replaces the external BibTeX program. Because it is written in LaTeX, it allows more control over bibliographies, and it handles UTF-8 encoding, unlike BibTeX.
- NOTE: Many journals still require the use of BibTeX or natbib.

Bibliographies in LaTeX

- Let's start with an example: <https://www.overleaf.com/read/vxfnvrxybtgg>
- Two files are needed: the document file (`main.tex`), and the bibliographic database (`tiny.bib`).
- Within `main.tex`, 3 commands are needed to create a bibliography:
- In the preamble:
 - `\usepackage[backend=biber,sortcites]{biblatex}`
 - `\addbibresource{tiny.bib}`
- And `\printbibliography` in the body of the document, where you wish the bibliography to appear.

Bibliographies in LaTeX

- Take a look at `tiny.bib`, the bibliography database in this project.
- Each record is of the form:

```
@kind{key,  
  info = value,  
  info = value,  
  .  
  .  
  .  
}
```


Document “kinds”

KIND	Description
@article	Journal Article
@book	Published Book
@booklet	Book (no publisher)
@inproceedings	Article in a conference proceedings
@manual	Technical documentation
@misc	Other
@online	Web page or online resource
@reference	Reference work (dictionary, etc.)
@report	Research report
@thesis	Any kind of thesis (use type to specify)
@unpublished	Not yet published

Document “info”

Info	Info
@author	@month
@chapter	@note
@date	@pages
@doi	@publisher
@edition	@subtitle
@institution	@title
@isbn	@type
@issn	@url
@journaltitle	@urldate
@keywords	@version
@location	@year

Bibliographies in LaTeX

Info includes author. The author can include multiple authors joined with and:

Author = {1st author and 2nd author and 3rd author}

Names can be listed as First M. Last or Last, First M.

The Last, First M. form is preferable, particular for complicated names.

BibLaTeX options

KIND	Description
backend=biber	Use biber for sorting citations (preferred)
backend=bibtex	Use bibtex for sorting citations
backend=bibtex8	Use bibtex8 for sorting citations
bibencoding=latin1	Bibfile encoding ISO-Latin1, if different from main.tex
bibencoding=utf8	Bibfile encoding UTF8, if different from main.tex
defernumbers	Safe (but slow) method to assign reference numbers
maxbibnames=n	Maximum number of authors listed in bibliography (default is 3)
minbibnames=n	Number of authors in abbreviated lists (et al. default is 1)
sortcites	Sort citation sequences
sortlocale	Sort bibliography according to local rules, default is English
style=xxx	Specifies bibliography style to use

Citations with `\cite`

As seen in `main.tex` the `\cite` command is used within the text to reference something. You can cite multiple documents at one time:

```
\cite{TeX-book,Breaklines}
```

`\cite` takes optional arguments, which specify pre- and post-fix text:

Command	Output
<code>\cite{TeX-book}</code>	[4]
<code>\cite[44]{TeX-book}</code>	[4, p. 44]
<code>\cite[Ref][]{TeX-book}</code>	[Ref 4]
<code>\cite[See also][xiv]{TeX-book}</code>	[See also 4, p. xiv]

Other forms of \cite

In order to output particular information for a reference in a citation, there are alternate forms of \cite

Command	Output
<code>\citeauthor{Tex-book}</code>	Knuth
<code>\citetitle{Tex-book}</code>	<i>The TeXbook</i>
<code>\citeurl{biber}</code>	http://www.ctan.org/tex-archive/biblio/biber
<code>\citeyear{Tex-book}</code>	1984
<code>\footcite{Tex-book}</code>	As a footnote ¹¹
<code>\parencite{Tex-Book}</code>	(Knuth 1984)
<code>\textcite{Tex-Book}</code>	Knuth [4]

¹¹ Knuth, *The TeXbook*

Standard Citation Styles

The citation style you select controls how the references appear in the text. The default style is “numeric” which simply puts a number in the text indicating a reference. Be sure to use “sortcites” option with numeric, so that [9, 11, 10, 8, 3, 9] becomes [3, 8, 9, 10, 11]

The Compressed Numeric style (numeric-comp) is will group successive references together [10, 12, 7, 5, 2, 3, 11, 4] becomes [2-5, 7, 10-12]

Standard Citation Styles

The alphabetic style uses the authors name and year of publication to create the reference: [Knu84]

The author-year style uses authors last name and year. Note that you'll want to use the \parencite version to include parentheses: (Knuth 84)

The author-title style uses authors last name and the title. Note that you'll want to use the \parencite version to include parentheses: (Knuth, *The TeXbook*)

Contributed Citation Styles

In addition to the standard styles, there are some other styles which have been included to follow APA style, University of Chicago Press style, as well as the “Vancouver” style.

They are invoked:

```
\usepackage[backend=biber, style=apa]{biblatex}
```

```
\usepackage[backend=biber, authordate]{biblatex-chicago}
```

```
\usepackage[backend=biber, style=vancouver]{biblatex}
```

Other Capabilities

You can split the bibliography to separate the books from the articles. Use the “type” option in `\printbibliography` to do this. You can then label each of these sections of the bibliography using the “title” option

```
\printbibliography[type=articles, title=Articles]
```

```
\printbibliography[type=book, title=Books]
```

Creating your .bib file

How do you create the database file containing all of your references? You can type them all in by hand, but that is tedious and can introduce errors.

Use your bibliographic management system to gather and format the references, and then export to a .bib file.

Endnote, Mendeley, Refworks, and Zotero all allow you to output your references in the proper format to a .bib file.

Note: you can output all of your references into a .bib file, even ones not cited in your paper. LaTeX won't include uncited references in the bibliography!

Useful References

- General

- https://www.overleaf.com/learn/latex/Bibliography_management_in_LaTeX
- <http://guides.library.yale.edu/bibtex/home>

- natbib

- <http://ctan.math.utah.edu/ctan/tex-archive/macros/latex/contrib/natbib/natbib.pdf>

- BibTeX and BibLaTeX

- <http://Bibtex.org> <http://bibtex.eu> <http://biblatex.org>
- http://tug.ctan.org/info/bibtex/tamethebeast/ttb_en.pdf

- Zotero – Better BibTeX for Zotero

- <https://retorque.re/zotero-better-bibtex/>