References (via BibTex) and Cross-References

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8. October 2025

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Slides prepared with assistance from ChatGPT 5.

Plan for today

1. Why, what and how to cite.
2. Build a bibliography from your `.bib` file.
3. Cross-references within your paper.

References:

Book by Krantz "A Primer of Mathematical Writing".

Overleaf guides on bibliography management and cross-referencing.

Part 1: Why, what and how to cite

Why provide references?

Scholarly honesty and respect:

- ☞ To acknowledge intellectual debt.

Mathematical anchorage:

- ☞ To situate your contribution.

Rigor and transparency:

- ☞ To make the paper verifiable and reproducible.

Expository value:

- ☞ To help the reader learn.

Historical connection:

- ☞ To maintain continuity of the discipline.

What should be referenced in a paper?

- **Theorems or results that you quote without proof** and form essential ingredients of your argument.
- **Definitions, terminology, or notational conventions** that are not standard but adopted from a specific source.
- **Earlier appearances of ideas, constructions,** or examples similar to yours.
- **Background or surveys** that provide broader context, especially when your work intersects multiple areas.
- **Tools that you rely on**, such as software packages, datasets, or computational methods.

What need not be referenced:

Material that is genuinely standard and found in any introductory text.

Simple facts that you prove or that follow immediately from your setup.

Primary vs. secondary sources

Primary sources = original papers

Secondary sources = textbook, survey, or exposition

In general, should prefer primary sources, but can cite both:

– **primary sources** for historical source,

– **secondary sources** for accessibility.

E.g. *Every compact toric symplectic manifold is determined by a unimodular polytope [Delzant 1988]; see also [Guillemin 1994] for an exposition.*

Citation practice

On-the-fly citation for most math papers:

Make a reference (by acronym "[Del]", or number "[9]", or author name "[Delzant 1988]") **at the moment of impact**.

Nowadays, avoid giving references in footnotes.

Specific publishers or contexts may require specific formats.

Moreover:

Prefer peer-reviewed **published** works.

Include **only** those references that you actually cite in the text.

Books vs. papers

For a book: Author, title, edition number (if not the first), publisher, city of publication, year of publication.

[17] Herstein, I. N., *Abstract Algebra*, third edition, Prentice Hall, Upper Saddle River, NJ, 1996.

For a paper: Author, title, journal, volume number of the journal, year, and pages.

[3] Atiyah, M., Bott, R., The Yang-Mills equations over Riemann surfaces. *Philos. Trans. Roy. Soc. London Ser. A* 308 (1983), 523–615.

☞ *Let LaTeX take care of it!*

Part 2: Bibliography with a `.bib` file

Recall: `.bib` file

Last time:

– Collected references in **BibTeX format** in a `.bib` file,
for instance `myrefs.bib`.

This is an ever-growing database of your bibliographic references.

– Put that file in the Overleaf project.

Need at least two files in your project: main.tex and myrefs.bib.

Today:

How to cite the references in the main file, so that compilation produces citations in the text and a bibliography list.

`main.tex` with package biblatex (*)

Need to:

1. add two commands to the preamble

   ```
   \usepackage{biblatex}
   \addbibresource{myrefs.bib}
   ```

2. add one command to the end of the body of the document (where you want the bibliography list to appear)

   ```
   \printbibliography
   ```

3. throughout the text, add `\cite{...}` each time you want to insert a reference, where "`{...}`" should contain the *label* that you chose to call that reference.

(*) Some alternative packages to biblatex are natbib and BibTex.

`main.tex` with package biblatex

```
\documentclass{article}
\usepackage{biblatex}       %Imports biblatex package
\addbibresource{myrefs.bib} %Imports biblio. file

\begin{document}

Every compact toric symplectic manifold is determined
by a unimodular polytope \cite{Delzant88}; see also
\cite{GuilleminBook} for an exposition.

\printbibliography       %Prints bibliography

\end{document}
```

myrefs.bib (first snippet)

```
@book{GuilleminBook,
    AUTHOR = {Guillemin, Victor},
     TITLE = {Moment maps and combinatorial invariants
              of {H}amiltonian {$T^n$}-spaces},
    SERIES = {Progress in Mathematics},
    VOLUME = {122},
 PUBLISHER = {Birkh\"auser Boston Inc., Boston MA},
      YEAR = {1994},
}
```

myrefs.bib (second snippet)

```
@article{Delzant88,
author = {Delzant, Thomas},
title = {Hamiltoniens périodiques et images convexes
                  de l'applica\-tion moment},
journal = {Bulletin de la Société Mathématique
                    de France},
year = {1988},
volume = {116},
number = {3},
pages = {315--339},
}
```

Compilation

With Overleaf: all runs automatically.

Locally:

`pdflatex` → `biber` → `pdflatex` → `pdflatex`.

i.e. pdflatex main.tex → biber main.tex → pdflatex main.tex → ...

Compilation produces multiple auxilliary files.

Output:

Every compact toric symplectic manifold is determined by a unimodular polytope [1]; see also [2] for an exposition.

References

[1] Thomas Delzant. "Hamiltoniens périodiques et images convexes de l'application moment". In: *Bulletin de la Société Mathématique de France* 116.3 (1988), pp. 315–339.

[2] Victor Guillemin. *Moment maps and combinatorial invariants of Hamiltonian T^n-spaces*. Vol. 122. Progress in Mathematics. Birkhäuser Boston Inc., Boston MA, 1994.

Point to a page or theorem (optional argument)

`\cite[TEXT]{LABEL}` instead of the simple `\cite{LABEL}`

E.g. `\cite[Lemma~3.3]{Delzant88}` or
`\cite[pp.~55-59]{GuilleminBook}`.

Every compact toric symplectic manifold is determined by a unimodular polytope [1, Lemma 3.3]; see also [2, pp. 55-59] for an exposition.

References

[1] Thomas Delzant. "Hamiltoniens périodiques et images convexes de l'application moment". In: *Bulletin de la Société Mathématique de France* 116.3 (1988), pp. 315–339.

[2] Victor Guillemin. *Moment maps and combinatorial invariants of Hamiltonian T^n-spaces*. Vol. 122. Progress in Mathematics. Birkhäuser Boston Inc., Boston MA, 1994.

Multiple citations

```
\cite{Delzant88,GuilleminBook}
```

> Every compact toric symplectic manifold is determined by a unimodular polytope [1, 2].

For the opposite order:

```
\cite{GuilleminBook,Delzant88}
```

> Every compact toric symplectic manifold is determined by a unimodular polytope [2, 1].

Now using `\cites` – notice the "s":

```
\cites[Lemma~3.3]{Delzant88}[pp.~55-59]{GuilleminBook}
```

> Every compact toric symplectic manifold is determined by a unimodular polytope [1, Lemma 3.3, 2, pp. 55-59].

Customizing the bibliography

Default with \usepackage{biblatex} is

```
\usepackage[
backend=biber,   %Sets biber as backend
style=numeric,   %Implements numeric citation scheme
sorting=nty    %Sorts by name, then title, then year
]{biblatex}
```

Choose **other options** via \usepackage[...]{biblatex}:

```
\usepackage[
backend=bibtex,     %bibtex (instead of biber)
style=alphabetic,   %alphabetic citation scheme
sorting=ynt      %Sorts by name, then year, then title
]{biblatex}
```

Customizing the bibliography, cont.

```
\usepackage[backend=bibtex,style=alphabetic,
sorting=ynt]{biblatex}
```

↓

Every compact toric symplectic manifold is determined by a unimodular polytope [Del88]; see also [Gui94] for an exposition.

References

[Del88] Thomas Delzant. "Hamiltoniens périodiques et images convexes de l'application moment". In: *Bulletin de la Société Mathématique de France* 116.3 (1988), pp. 315–339.

[Gui94] Victor Guillemin. *Moment maps and combinatorial invariants of Hamiltonian T^n-spaces*. Vol. 122. Progress in Mathematics. Birkhäuser Boston Inc., Boston MA, 1994.

Customizing the bibliography, cont.

Easy style switch:

- Change options by `\usepackage[...]{biblatex}` only.

  See biblatex guide for all optional arguments.
- No edits to your `\cite` commands needed.

In order to include **references that are not cited** in the text, use `\nocite{LABEL}`.

The bibliography list may be further customized, for example:

```
\printbibliography[type=book,title={Book References}]
\printbibliography[nottype=book,title={Other References
```

prints two sections, one containing only books and titled *Book References*, the other the rest titled *Other References*.

Better style

Bad: See Guillemin [1994] pages 55-59 for details.

Good: `See \cite[pp.~55-59]{GuilleminBook} for details.`

Bad: Using Lemma 3.3 of Delzant (1988), we deduce...

Good: `Using \cite[Lemma~3.3]{Delzant88}, we deduce...`

Workflow summary

- Keep a single `myrefs.bib` for the project;
  add entries via MathSciNet/zbMATH/arXiv export.
- Each entry must have a unique LABEL (*nickname*),
  such as `Delzant88`.
- Overleaf runs Biber (or BibTeX) automatically;
  Locally: `pdflatex` → `biber` → `pdflatex` → `pdflatex`.
- If compilation fails: check braces, commas, and that you have not misspelled the LABEL in your `\cite`.

Part 3: Cross-referencing in main file

Core pattern

Label objects, then refer to them.

```
\section{Convexity}\label{sec:convexity}
As shown in \cref{thm:main}, ...

\begin{theorem}\label{thm:main}
Let $f$ be ...
\end{theorem}

\begin{equation}\label{eq:Euler}
e^{i\pi}+1=0 \end{equation}
By \cref{eq:Euler} ...
```

\label goes inside the numbered environment.

With or without `cleveref`

Plain vanilla (without `cleveref`):

```
See Section~\ref{sec:convexity}.
By Theorem~\ref{thm:main} we have ...
From \eqref{eq:Euler} it follows that ...
```

With package `cleveref`:

```
See \cref{sec:convexity}.   %auto-filled "Section"
By \cref{thm:main} we have ...
From \cref{eq:Euler} it follows that ...
```

`cleveref` automatically fills in "Theorem", "Section", pluralizes lists, etc.

Cross-references that travel well

Bad: See the equation above.

Good: See (1.7).

```
See \eqref{eq:Euler}.
```

Good: See Equation (1.7).

```
See Equation \eqref{eq:Euler}.
```

Bad: As we proved earlier,...

Good: As shown in Theorem 2.5,...

```
As shown in \cref{thm:compact},...
```

Homework due today

Check guidelines for Paper 1 on course webpage.

- Did you go over the checklist?
- Did you name the file as requested?
- Did you do an AI-assisted review (optional)?

Assistance available in the second hour.

Homework for 15/Oct

Paper 2 = Anonymous review of a colleague's Paper 1

Check guidelines for Paper 2 on course webpage.

- Tomorrow (9/Oct) find on Moodle your paper to review.
- Write one page of constructive report with LaTeX.
- Avoid AI for this review.
- This counts one point for Pass/Fail.
- Follow guidelines on course webpage.
- Upload your report (with requested name!) on Moodle.
- Report technical difficulties.

Homework for 22/Oct only possible starting 16/Oct.