

Senior Laboratory

PHYS 493L, Spring 2025

Lab Time: Tuesdays & Thursdays, 8am-10am

Lab Location: PAIS 1417

Lectures and Group Meetings: (most) Tuesdays & Thursdays,
10am-10:50am in PAIS 1405

Instructor: Tara Drake

Email: drakete@unm.edu

Offices: PAIS 2234 and CHTM 118B

Teaching Assistant: Xiaoxuan (Shane) Li

Email: xli1@unm.edu

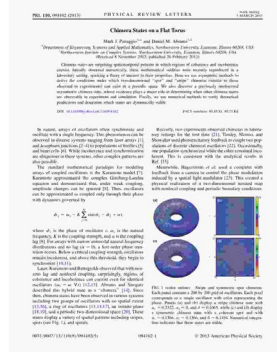
Manuscripts/Lab Reports

Each student produces a **separate** journal-style, manuscript based on their experiment.

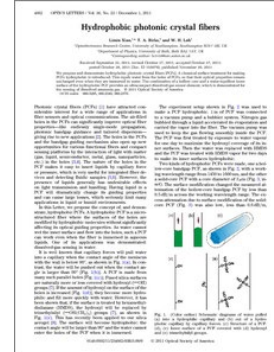
Should follow the style of a scientific journal.

- See Optics Letters or Physical Review Letters
- LaTeX template will be provided.

Phys. Rev. Lett.



Opt. Lett.



Next lab report is due **Tuesday, Feb 25, before class.** Please submit **by email.** You are also required to bring in a **printed draft on Thursday, Feb 20.**

Figures

IMO, the make-or-break of a paper.

1. All axes have labels and units.
2. Figure caption
 - Separated from main text (standard journal format)
 - Enough detail that the main concept is clear without reference to text. A reader should be able to answer, “what measurement is this showing?”
3. Figures have numbers (Fig. 1, Fig. 2) and at least one referral in text.
 - If there is Fig. 1a and Fig 1b, both appear in text separately.
4. Text in figure (labels, etc.) is big enough to read (similar in size to text).
5. If figure is taken from somewhere, “Reproduced from []” must be in caption.

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Abstract

How reader decides if your paper is worth their time!

The abstract contains a summary of your manuscript:

- It is short (~250 words).
 1. Briefly state the motivation and give context for the work (~ one-two sentences)
 2. Problem statement/statement of work (~one sentence)
 3. Statement of methodology and results (with errors)
 4. Relevance of results to your field, other disciplines, or general public (depending on the journal's audience)

(This is the “long version” of an abstract.)

- Completely encapsulates your paper

Abstract

Other abstracts you will see:

Variation 1

1. Problem statement/statement of work (~one sentence)
2. Statement of methodology and results (with errors)
3. Relevance of results to your field, other disciplines, or general public (depending on the journal's audience)

Variation 2

1. Briefly state the motivation and give context for the work (~ one-two sentences)
2. Problem statement/statement of work (~one sentence)
3. Statement of methodology and results (with errors)

But we practice the long version because:

- It is easily reduced to the other forms.
- It works great for talk/conference abstracts (i.e. independent of a paper).

Manuscripts

Main sections (see guide in class website for specific details)

- **Abstract**
- **Introduction:** motivation, background and summary of experiment
- **Methods:** description of experimental methods and **calibrations**
- **Data:** present the data, use plots or/and tables
- **Results and data analysis:** describe how the data analysis was done and present your results with uncertainty and error analysis
- **Discussion**
- **Conclusion**
- **References:** Pick a consistent format. If you don't know one, use this:
A. Author, B. Coauthor, C. Lastauthor, "Title," *Journal using standard abbreviation such as Nat. Phys.* **Volume**, first page–last page (year published).
- **Appendix if necessary**

Writing in LaTeX

Your lab reports should be written using LaTeX typesetting language.

There are many LaTeX editors. Overleaf is probably the simplest if you are starting out:

- Open overleaf.com
 - Create an account if you do not have one.
- Upload the files from “PRL template v2.zip”
- This document should help with formatting equations, tables, figures, etc.

Examples of Abstracts...

Abstract

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For next class (Thursday):

Create an overleaf account and upload the PRL template and other LaTeX doc. Use the template to create a document for manuscript 1.

Then you should either:

- Write the abstract for your first manuscript/lab report. (If you are missing results, just make a note or an “XX” where they will go.)

Or:

- Create a complete figure with a caption.

And print it out to bring next week. (see me if printing is difficult)

