

Intermediate Physics Lab (P440/441) – Preparation of Manuscripts

Rather than a conventional lab report, the group will produce a manuscript in the form required for the research journal *Physical Review Letters*. The *only* difference will be the length: your manuscript will be no more than nine pages total, including abstract, text, references, figures & figure captions, and tables.

The purposes of the manuscript are the same as for the final presentation, which we repeat here:

(a) To tell us *what you did* and *why*. Do not assume that your reader already knows the new physics that you have had to learn to do the experiment. Do not assume your reader knows anything at all about the experimental setup. Show at least some real data to make your reader believe you really did an experiment.

(b) To convince your always-skeptical reader that you understand the main sources of uncertainty in your results.

(c) To present your results in an honest, straightforward way. Do not oversell by pretending to measure results that you really didn't; do not undersell by failing to extract all the possible value from your data and observations. Of course, any omissions or errors that came to light during the final presentation must be dealt with correctly in the final manuscript.

(d) To present raw data as well as the results of analysis. Large data tables are not helpful; usually a plot will suffice. The text can provide, for example the parameters from a curve-fitting analysis (in which case the best-fit curve should be shown on the plot).

The journal *Physical Review Letters* (PRL) provides guides to style and formatting, to which you can refer. They are available on the web (along with the journal itself) at <http://www.prl.aps.org>. You can also find information on the PACS numbers here or use Google. But please do not worry about details of font type, and do note that the length limitation that we use (specified on the next page) differs from that of the journal.

Procedure:

1. Get a copy of a recent article in PRL, either electronically or at the library, to use as a guide to follow. NOTE: As *printed*, the manuscript is two columns, single spaced, with figures embedded. As *submitted to instructors and your peers*, the manuscript is one column, double spaced. To facilitate editing, place each figure on a separate page at the end of the manuscript. Each figure must have an informative caption ("Fig. 1. Diagram of the apparatus. The blah, blah, blah..."). See the following page for details.

2. The designated first author will produce a manuscript using a word processor (or Latex/RevTeX, if you know how and wish to). **The draft *must* include all necessary elements: Abstract, PACs numbers, references, figure captions, and figures.**

3. Print one copy for the instructors and give it to them in person or to the designated place. **These manuscripts are due on the designated date and must meet the style requirements.** Using the form on the next page, the instructors will do a quick "editorial style check". **Major noncompliance with the style guidelines must be repaired immediately before further consideration of the manuscript.** Once the style guidelines are met, we will review the draft and add our comments.

4. At the same time, distribute copies of the draft for the other group members. (Use the ILab file cabinet and email notices to aid in distribution to your colleagues.)

5. The other group members will mark up their copies of the draft, suggesting changes both minor and major. **We expect substantial editing from each group member, not just a few minor changes.**

6. **The final version of the manuscript is due one week after comments on the edited drafts are received.** (This is specified in the course schedule.) **IMPORTANT:** Please bring the *first* drafts with the written comments to the lab or to the instructor's office, along with a single copy of the final manuscript.

ILAB – Editorial Style Check for Draft Manuscripts

Authors (draft originator first): _____

Project: _____ **Checked by:** _____ **Date:** _____

1. Typed manuscript with all figures, distributed to all other group members –
2. 8.5 by 11” paper, 1” margins, 12-point type, double-spaced, single column –
3. Meets nine page length limit (total, with figures, references and all; see item 4 below) –
4. Following elements, in this order:
 - Title –
 - Authors (Person responsible for Manuscript listed first) –
 - Department, University, City, State, Zip –
 - Date –
 - Abstract (up to 100 words in length) –
 - PACS numbers (one or more) –
 - Body of article (text) –
 - List of References –
 - Figures (each figure on a separate sheet, with descriptive caption underneath) –
(Note that two closely-related pictures or plots can be parts (a) and (b) of a figure and count for one page. But they must be closely related in a logical way.)
5. References in text in PRL format (“...according to earlier investigations [3].”) –
6. List of cited articles and boos at the end in PRL format (“[3] J. Jay, Phys. Rev. Lett. **85**, 298 (2000).”) –
(the numbers correspond to **volume**, first page #, and year.)
7. Special characters and super/subscripts printed or clearly written in standard mathematical notation (*e.g.*, 3×10^{-5} , not $3 * 10^{-5}$) –
8. Equations: Short equations such as $F_x = ma_x$, may be written in-line with the text. Variables and parameters are usually written with italicized fonts. To make Greek letters, you can convert Roman letters to Symbol font Long equations (*e.g.* fractions containing numerators or denominators with multiple terms) should be given a dedicated line of text and a number at the end of that line.