

Paper

Use the following description of a scientific paper and the further information as guideline for your paper.

Audience: Your audience are juniors and seniors who have not done the lab you are describing. Include therefore all information which is necessary to follow your paper.

Further Information (see links on PHYS 310 web page):

- The Art of Scientific Report Writing,
<http://semiconductor.materials.ox.ac.uk/uploads/manuals/AD34.pdf>
- Ten Steps to Writing an Effective Abstract
<https://www.sfedit.net/wp-content/uploads/2019/10/Ten-Steps-to-Writing-an-Effective-Abstract.pdf>
- R. E. Adelberger, J. Undergrad. Research in Physics **18**, 32.
- D. Chowdhury, L. Santen and A. Schadschneider, Curr. Sci. India **77**, 411 (1999).

Group Work: You are encouraged to work together on getting the results of your lab. You may also work together on the analysis and the corresponding figures. However, for the final write up of your paper you may not work together! You have to find your own words. Do not copy sections of any other source (world wide web, books, etc.) without quoting and referencing the source!

Contents:

- Title
- Author(s), Address
- Abstract: An abstract is a short summary of your experiment/simulation and your results. The abstract is for a reader who might not have time to read the rest of your paper or who decides depending on your abstract if they read the whole paper. The abstract should be understandable without the rest of the paper.
- Text: The following text should be understandable by itself. Reference any information which you used from other sources or which includes details not necessary for the reader's understanding.
 - Introduction/Background¹:
This section might give some historical background and/or necessary background information. You might talk about similar experiments/simulations which have been done previously. The Introduction also serves as a motivation for why your experiment is of specific interest and importance. The main purpose of the introduction is to put your experiment into context and to give a general description of your project. You might end your introduction with an outline of the rest of the paper.

¹Sometimes this is split into two sections

- Theory:
This is a section one uses if there are analytical calculations possible. For theoreticians this is the main section.
- Model (for Simulations):
In this section you describe your model exactly. This includes for example the main differential equation which defines your system. For systems like the Ising model this section includes the specification of the lattice and number of dimensions. In principle, after reading your description any reader should be able to write the program with exactly the same model as yours.
- Simulation (for Simulations):²
This section includes the method you use (e.g. Metropolis Algorithm). Together with the model section all information should be provided that the reader could reproduce your data, i.e. all used parameter values should be given.
- Experimental Methods:
This section describes the experimental set-up. It should describe the equipment used, how the experiment was set up, and experimental techniques. You should provide enough information, so that the reader could in principle reproduce your results.
- Results:
This section describes the results of your experiment/simulation (including uncertainties). It can include tables, formulae and figures. Tables and figures should have captions and formulae should be numbered.
The results might be presented in several sections and might not have the title “Results” but titles corresponding to the topics (e.g. quantities measured and further analysed).
- Conclusions/Discussion:
In this section you draw conclusions of your results and you might include what one could do in future work.
- References:
This is the bibliography of all references to which you refer in the text.

²This section is often combined with the section “Model.”