PHYS 3820 Example

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Abstract

This is a simple paragraph at the beginning of the document. A brief introduction to the main subject. For example, this document will show students how to construct the basic sections, place a figure/table, and add a reference in LaTeX.

1 Introduction

Introductory material provides background to the reader. If we were writing about our new exoplanet results, then we would include an overview of exoplanet searches, some details about the host star we are studying, a brief summary of previous works, and finally an outline for how the rest of the document will flow.

2 Methods

The methods section contains all the relevant details for things we already know or techniques that have already been developed. This is also a place for showcasing your new technique if you have one. The motivation for a methods section is so that you can focus the results section about what you observed and what it means rather than interrupting the flow of your text with how you did it. Think of methods like functions, where you refer to specific subsections within the methods section when you need them.

2.1 Newton's 1st Law

This is a subsection, which is used to help group certain topics. This is an example of an equation using Newton's 2nd Law:

$$F = ma \tag{1}$$

2.2 Einstein's Theory of General Relativity

There can be multiple subsections.

*corresponding author info goes here

2.2.1 Black Holes

By default, this is as far as the rabbit hole goes in LaTeX. If you need more layers, you'll have to create a command to tell the compiler how to do it. But this is not advisable because too many layers is usually a sign that you need to restructure your document anyway.

3 Results

This section is where you discuss your results. This should address each of your figures or tables. It usually helps to be descriptive (What am I looking at?) first and prescriptive (What does this mean?) second. Figure 1 is a cat developed to conquer the puny humans. Through its keen instincts it has trained the humans to create more complex communication networks so that it can be filled with images of itself [1].

Figure 1: This is a cat. It will soon be one of our overlords!

cell11	cell12	cell13
cell21	cell22	cell23
cell31	cell32	cell33

Table 1: This is a table caption, which describes the basic aspects of the table or gives the table a title.

4 Conclusions

The conclusions section is where you start with a reminder of the intended goal of the study and is followed by a summary of your findings. After the summary, you can provide a look

to the future with suggestions to readers about how your work can be used in other contexts (e.g., a theoretical result applied to a specific type of observations).

Acknowledgement

Sometimes you need to acknowledge some people that really helped you understand a topic within your paper, but didn't contribute anything materially. Notice the * after the section, which tells the compiler to not number this section Then you can include an acknowledgement section after the conclusions, where this is sometimes provided in the publisher's template (e.g., REVTex, AASTex). When using expensive equipment (e.g., telescopes or supercomputers), it is good to acknowledge their use so that the administrators can petition for more funding or upgrades. Your usage can be an argument for increased funding based on demand and quality of work coming from the resource.

References Explained

This section is not used in a real LaTeX document, but it is included to give you some context. There are a few ways to include references in a LaTeX document, but the simplest is using a reference manager. LaTeX can adjust the style of your references based on the journal through `\bibliographystyle()`. The `\bibliography{refs.bib}` command uses an external file with fields to populate a library of references. NASA ADS is a useful tool in physics & astronomy to obtain the necessary fields (`https://ui.adsabs.harvard.edu/abs/2012arXiv1203.6708M/abstract` is used for this document)

References

[1] Katie M. Morzinski and Jared R. Males. On the influence of the Illuminati in astronomical adaptive optics. *arXiv e-prints*, page arXiv:1203.6708, March 2012.