Thesis and Paper Writing Hints
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Resources
The Wikipedia article on scientific writing is excellent (but may no longer exist) http://en.wikipedia.org/wiki/Scientific_writing
I really enjoy the hints from Grammar Girl’s website and podcasts: http://grammar.quickanddirtytips.com/
For PhD theses see the general UQ guidelines at: http://www.uq.edu.au/grad-school/thesis-preparation
As well as the specific rules about ways you can include published papers in your thesis: http://www.uq.edu.au/grad-school/publications-and-theses

General Chapter Structure
Each chapter should always have this minimum structure.

• A title that shows what the chapter is about in simple language.
• Introduction to the chapter
  o a brief section telling you what the chapter is about and how it fits in the rest of the thesis
  o this would normally conclude with a brief description of the different sections in the chapter
  o this does NOT contain any of the work the chapter presents
• Body of the chapter
  o sections of new work presented in this chapter
• Summary of the chapter
  o including link(s) to following chapter(s)

Critical Literature Review
Whenever you review the literature about a research topic, you need to make it critical. This means you are not just listing previous work but discussing it and saying what was good and what was bad. That’s essential if you are to justify why you should do any new work on the topic.

Including some broader items about your own project you would include the following.
• Aim of the project
• Critical Literature Review
• Why the topic is important
  o Why the topic is important. In grant applications you are asked to explain the significance; that’s just another way of saying importance.
  o what gaps there are in current knowledge
• Your project
What is **new** about your discovery or approach and how it will fill those gaps. In grant applications this is called **innovation**.

**Talks**

- Decide on one (2 at most) thing you want them to remember and tell it to them at least 3 times (intro, body and conclusion)
- Two basic themes to stress are: what is new about your work (results and/or methods) and why is it important (background)
- Combine title and contents pages into one slide so all the information is up while late people are coming in
- Make a very clear break between background and the start of your project: use spoken and written words to emphasise this break

**Grammar**

Astronomers often use terms like ‘elliptical’ (E) or ‘dwarf elliptical’ (dE) as nouns but they are actually adjectives; the correct usage is to talk about ‘elliptical galaxy’ (E galaxy) or ‘dwarf elliptical galaxy’ (dE galaxy)

**Sentences**

A sentence usually needs a subject and a verb and possibly an object. The form of the verb (singular/plural) **must** agree with the subject.

**Plurals**

The following nouns are **plural**: spectra, criteria, colloquia. ‘Data’ is technically plural but is starting to be used as a singular noun in common usage. Be consistent in your choice for ‘data’.

**Punctuation**

Displayed equations all need to be punctuated as part of a sentence in the surrounding text, to the point of having a full stop if they end the sentence. Footnotes also need to end in a period (full stop).

**Bibliography**

Citations to the literature in Astrophysics should always be formatted in the Harvard style, e.g. Smith et al. (2008), not by numbers as in other areas of Physics.

**Apostrophes**

Are nearly always used to describe possessive cases and not plurals. For the plural you just add “s”. There is an exception for “its”: this is a special rule you just have to learn:

**POSSESSIVE case**: its

**ABBREVIATION of "it is"**: it's
**Tenses**
You should generally write in the past tense as you are describing the research you already did. However whenever referring to something in your document you use the present tense (e.g. “Figure 2 shows that our results contradict the earlier work by Smith”).

The passive voice (e.g. “The mass was estimated by using the virial theorem.”) should be avoided if possible as it can be ambiguous as the verb subject is not specified. Better to use the normal voice which is simpler, shorter, and clearly specifies the verb subject (e.g. “We estimated the mass by using the virial theorem.”).

**Figures**
Should have self-contained captions and should all be referenced in the text. The captions should ideally start with a simple summary of what the plot contains. References to figures, tables, section etc. should be capitalised if for a specific section as in “Section 2”.