



2022-04-02

## How to Write Your First Academic Papers

@spacewsarah

Are you about to write one of your first scientific papers? Do you have a result and feel ready to compile your work? You might be done with your analysis and want to start writing the methods section? Here's some advice that I've collected and adopted over the years. Keep in mind that writing papers is a very subjective experience, but maybe some of these tips will resonate with you.

1. **Template:** Ask your advisor or fellow graduate students for a paper draft template. Each journal has different style guides.
2. **Section headings:** Write out the titles for each section as well as the titles of each subsection in your paper draft. This will help you outline the story and what you want to include in your paper.
3. **Figures:** Place all figures in the correct order in the draft. Put blank placeholders for figures that you might want to include in the paper later. This can help you see the bigger picture and develop the storyline of the paper before writing.
4. **Imagine a friend.** When you start writing, imagine a specific graduate student that you know. When you envision another student, this can help you write more informally and without judgment. Tell them what you did, why it's exciting, and why they should care. I found that pitching the level of your writing to a

graduate student in your field seems about right for a scientific paper.

5. **Write without judgment.** As you start writing, focus on getting the words down. Don't judge how it sounds or spend too much time on each sentence. A trick that I've heard, but haven't yet used, is to record yourself and write down the words after.
6. **Avoid jargon.** It's difficult to avoid all jargon (such as galaxy, black hole, white dwarf etc.) but avoid jargon when possible. The more people who can understand your paper, the more likely it is to be read and shared.
7. **Use active voice.** Active voice can help you be more direct and clear when you write. If you write "Through analyzing the simulations, it was evident that ...", it is unclear who analyzed the simulations and you also add unnecessary words. Instead write "We analyzed the simulations, and found that...". The rule can almost be boiled down to "avoid *ing* words".
8. **Leave the draft.** Leave the draft for a few days. Then read it again and edit it several times. This technique can be applied to the whole paper or just single paragraphs or sections. I found that even if I write quite poorly at first, after only a few iterations the text ends up being clear and concise.
9. **Edit carefully.** Look at each sentence and paragraph critically. Ask yourself: Can this be said simpler? Would it be clear to someone who had never heard about this project? If it can be said simpler: Edit again. No one ever complained about anything being too easy to understand. The topic is most likely very complex, but the writing shouldn't be.