Managing your PhD
…and some other things I wish I had known when I started mine

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My PhD experience

I completed my PhD in July 2010 at the University of Tasmania. I finished in 3.5 years to the day, which was also the day that my funding ended. I had excellent relationships with my University supervisor and my co-supervisor at CSIRO, and still work closely with both of them. I wrote three MNRAS papers during my PhD and am still writing papers based on work in my thesis. I worked on many projects that weren’t directly related to my thesis work, including several surveys and some smaller projects without my supervisors. I spent three months working overseas split between the University of Manchester and the Max Planck Institute for Radio Astronomy and returned about 9 months before I submitted. I was generally very involved in the astronomical community and was on the organising committee of several conferences and other events. In hindsight, to have saved my sanity, I probably shouldn’t have worked on so many side-projects, both scientific and conference/event organisation, but I also believe these were some of the things that set me apart from other candidates and allowed me to get the job I wanted. I am currently working at CSIRO Astronomy and Space Science as a Bolton Fellow and love my job.

What is a successfully managed PhD?

To me a successfully managed PhD is one that:

- Has placed you in a strong position to get the kind of job that you want
- Has been completed in a timeframe that you are happy with
- Was (at least sometimes) enjoyable

There is certainly not a magic recipe to ensure successful PhD management, and the specifics are largely dependent on the individual. The following sections describe some of the components that I think are important which have been largely shaped by scenarios that worked for me and my supervisors.

General advice

While putting these notes together I asked a number of astronomers for general advice that they would give PhD students. Below is a list of some of the things that they said.

- PhDs aren’t for everyone. If it isn’t what you want then get out early
• The best researchers are often not the most intelligent

• Other students and early post docs can be the best place to get help

• Don’t worry if you feel like you have to redo everything that you did in your first year – it is the skills that you acquire that are critical rather than the actual work that you do, and you are likely to do it better and faster the second time around

• The students around you are likely to be your peers all the way through your careers so don’t burn bridges and make an effort to maintain connections

• Use the licence to ask ‘stupid’ questions because it won’t last forever

• Don’t become an observing slave

• Choose your department and supervisor carefully

• Don’t feel locked into a particular type of science, wavelength etc. PhDs rarely end up looking like you thought they would at the start.

• Take advantage of opportunities as they come up, you never know where they will take you

• Tag along on observing trips with other students/post docs even if the observations/wavelength is not related to your science. You will gain valuable experience, meet other astronomers and get lots of work done

• Get experience teaching, tutoring and in support roles. All look good on your CV and help you decide what type of job you want.

**Time management, organising and planning projects**

How you manage your time is a very personal thing. What works for you may not work for someone else. The general prescription that I try and follow is:

• Work out where you want a project to end up and set goals to get there.

• Prioritise the most important stages (and any deadlines like telescope time).

• Set yourself mini-deadlines, or set aside specific amounts of time for certain tasks (you will get better at knowing how long it takes you to do something). If you need to, encourage your supervisor to hold you accountable the deadlines you set.

• Review where you are at regularly and compare to the goals you set yourself.

• Reward yourself for sticking to your plan.
Overall I think the key to productivity is motivation. If you are not motivated then all of the
time management skills in the world aren’t going to help you. Some of the ways I stayed motivated were:

- Choosing a good project with plenty of variety. If you really don’t like your project you should consider changing it sooner rather than later
- Having more than one project on the go. When I had enough of one I would swap
to another for a while. This is a great way to keep things fresh, but doesn’t work for everyone
- Having supervisors that really cared about what I was doing. If you have someone
who gets excited about the amazing plot you just made it helps enormously
- Meet with your supervisor regularly to make sure you show them that amazing plot
- Enjoying time out. It is ok to take a full weekend to enjoy life and not give a single
thought to your PhD project

The biggest time sink for me was trying to remember where I put that random piece of
paper that I wrote that important thing on. Keep comprehensive notes in an organised
and systematic way (evernote is perfect for this). Something that you think you have
committed to memory will probably be gone the next time you have to do it (or when it
comes time to explain what you did in your thesis).

Take advantage of other gadgets that are there to keep you/your work organised and
save you time (e.g. toodledo, papers).

Remember that your time is important too and you don’t always have to say yes to
everyone.

**Managing your supervisor**

Choosing a supervisor that you work well with is very important, so hopefully you chose
well! The kind of relationship you have with your supervisor can range from a friend that
you speak to everyday, to someone that you see in a monthly meeting. The key is to
make sure that it is working for you, allowing you to be the most productive that you can
be. If you are not satisfied with your supervision be proactive and speak to your
supervisor, your head of school or your post-graduate representative about the problems
that you are having and take steps to rectify the situation. After all it is in your supervisors
interests for you to be a happy and productive researcher.

A common complaint seems to be that supervisors don’t always have enough time to
devote to their students. If this is the case, try to schedule a regular meeting. This is a
good idea because your supervisor has a better chance of devoting the time to you if they
can block out a regular time slot, and as a bonus you will stay motivated and on task if
you know you have to face them at regular intervals.
Trust and respect your supervisor’s opinion, but challenge them when you don’t agree. Most of the time they will probably prove that they were right, but your PhD is about you becoming a successful independent researcher and part of that is having your own opinion and thoughts. Remember that it is YOUR PhD.

**Thesis writing**

Ah the ‘t-word’. The word used to make me cringe, but looking back it really wasn’t that bad. The two factors that really helped make it a positive experience are simple: 1) I wrote papers as I went so a lot of the work was already done when I came to write up; and 2) I left myself enough time to do it so I wasn’t scrambling at the end.

Just about everyone’s thesis takes longer than they think it will – don’t feel like you have failed if you don’t make the submission date that you set out 3 years earlier! Some of the advice that I was given, and tips that I have, for getting your thesis done are:

- Be organised and make sure you keep good notes throughout your project
- Work smart and hard throughout – saves you a lot of pain in the long run
- Write papers as you go, if you write enough then your thesis is already mostly written. Also, if most of your thesis is published it leaves little room for argument from examiners and as an added bonus it helps you get jobs.
- Be aware of your University’s requirements and get formatting etc right from the beginning
- There are a number of thesis style files on the web, use one if it works for you (I used Jamie Stevens’)
- Don’t rewrite your literature review and introduction until the end. Make sure that it sets the scene correctly for the thesis that you end up with
- Just because you started something during your PhD doesn’t mean it should end up in your thesis
- Make sure that several people have proofread it. There is nothing more annoying than spelling mistakes and typos (for both you and your examiners)
- Just do it. The actual advice I received along these lines had slightly different words, but the meaning is the same. It seems simple but it really helped me get perspective on the components of my thesis that mattered
- Side projects are great, but make sure you don’t take on too many
- Don’t be afraid to say no
- A support network is vital. Talking with someone who as been there is invaluable.
• Have a strict timeline for your last 6 – 12 months

• Remember to give yourself due credit

**Paper writing**

While my thesis writing wasn’t a bad experience, I don’t look back on my first paper writing experience quite so fondly. Paper writing is a skill that has to be learnt so don’t be surprised if your first paper takes you a very long time to initially write, and then a very long time to get up to publication standard. Most people go through an ‘I can’t do it’ stage during their first paper, the important thing is to push through it and remember that you are not alone.

Below is some advice that might help you through those early papers.

• Read lots of papers and look critically at the things that you do and don’t like about them. Take note of the style and terminology.

• If you are struggling then write the easy bits one by one. Once you get some text on the page you will become more confident and motivated to tackle the more difficult sections. If you are an observational astronomer the easy bits are often parts of the introduction (which can often be cut out of the telescope proposal of the results you are publishing) and the observations and data reduction.

• If your progress has stalled because you are stuck on something – get help! Talking about it can really clarify things in your mind and 9 times out of 10 you will wonder why the problem ever stumped you.

• The way I tend to tackle a paper is to make the figures and tables first and then add the text around it. This way you will know the general shape of the paper before you start writing, ensuring that the text is relevant.

• Take time with the words because they are important. You don’t want to give someone a reason not to read about the amazing science you have done.

• Good figures tend to grab people’s interest, so make them look good and be as clear as possible. Make sure that the caption has enough information to allow the figure to stand alone.

**Networking**

Networking is not something that I thought a lot about as a PhD student, thinking that it is something that people with jobs did, but in hindsight should have. Geraint Lewis gave an excellent talk on networking at a recent workshop for early career researchers (notes from this should be linked from the ASA website soon) and this is largely based on what I took away from his talk.
If you want to be successful in the world of astronomy you will probably have to consciously cultivate your career and networking is an important aspect of this cultivation. Your network should be made up of a number of people that can contribute to different facets of your career progression. Some will know you and your work to a level that they can comment on you in both official (e.g. references) and unofficial (e.g. casual comments to their mates who could be your future boss) capacities. Others may offer you mentoring and advice, or be collaborators on projects, expanding your research areas and knowledge. **Building a strong network is important because it will work for you behind the scenes.**

When you start applying for jobs most will ask for three references – do you know three people that could provide a reference that helps you stand out from other applicants? If you have a good network then the answer would be yes.

How do you expand your network? Be visible, publish, go to conferences and give talks at a variety of institutions. Make sure that you participate at conferences, rather than being passive - ask questions, make points and establish collaborators. Avoid just talking to the people that you know at the conference reception and dinner.

Geraint suggested that a good way for PhD students to be visible is to send emails to the authors of papers that you like, saying how much it interested you and using your licence to ask ‘stupid’ questions. If people recognise your name, then you instantly go into a different category when being considered for jobs.

**Funding opportunities**

You can have all the best intentions to get out into the big wide world - observe at telescopes and present your work, but if your supervisor or University has no funding these dreams can by short lived. There are many other places to get money for travel; you just need to know where to look. Make sure you check if the conference you are attending has funding for students, sometimes even if there is no funding the organisers will waive the rego fee. Getting funding from external sources not only allows you to do the things you wanted to do, but also looks very good on your CV as it shows initiative, resourcefulness and a track record of success. Below are some links where either I, or someone I know, had success during their PhDs.

*Sigma Xi Grants-in-Aid of Research Program*
Deadline March 15 and October 15 Annually
Give out grants of up to $5000 for astronomy students to help them carry out successful research. I got one of these during my PhD mainly to cover travel expenses for observing and some conference expenses.

*Australian Federation of Graduate Women Inc. Fellowships, Grants and Bursaries*
Various deadlines
The AFGW give out various scholarships ranging from $1500 - $6000. Some of the scholarships you have to be a financial member of AFWG to apply. Most are only open to females.
ASA Student travel assistance

Deadlines 31 March and 30 September
The ASA gives out grants of $1000 for overseas travel. To apply you have to be a member of the ASA.

Jason
A database of funding opportunities for Australian students.

Job Applications

Applying for jobs for the first time can be a daunting prospect. Rely on the advice from your supervisor; they are in the best position to help you decide what to apply for. Mine bullied me into applying for the prestigious jobs that I really wanted, but didn’t think I’d have a shot at, and it paid off. Some of the best advice I have received is listed below.

- Set your sights high. Not applying is the only guarantee that you won’t get the job.

- Read the job advertisement and all supporting documentation carefully, and follow the instructions given. Send an email to the contact person for further information.

- Ensure that your application is as professional as it can be. Make sure you proofread everything.

- When addressing selection criteria don’t just say that you can or have done the thing they are asking about, list examples of when you have done it/used the skill.

- Spend time making the content and presentations of your CV impressive. Lots of people have links to their CVs from their homepages. Read lots, see what you think works well and what doesn’t. Make sure it is well set out and looks professional.

- Ask supervisors or mentors for help.

- Think about how to set yourself apart from other applicants. Students are often too focused on details so make sure you know why your work is important and how it fits into the bigger picture.

- Include a cover letter even if it doesn’t explicitly ask for one. If you are uploading your application to an online application system and there is no field for a cover letter attach it to the front of your CV.

- Choose referees carefully and give them enough time to do a good job. If you can send them your application well in advance of the deadline, then do it so they can tailor your reference to the job.