The academic life

Undergraduate → Postgraduate → Postdoc → Faculty




Postgraduate research

- First step into an academic career
- Options are research masters (MSc) or doctorate (PhD)
- PhD is needed eventually, MSc is a step on the way especially from a non-astro background
- MSc 1-2 years, PhD 3-4 years
- Sometimes a MSc can lead straight into a PhD in the same subject/institution

Postgraduate research

- PhD students in Europe are normally paid! (a bursary in the UK, a real salary in NL).
- Fees are normally also covered
- Self-funded PhDs are an expensive business (usually for rich retired people)
- MSc students normally are not paid (but DARA ones are, see below)
- Fixed time to completion – then the money runs out.

DARA opportunities

- DARA pays all fees and a bursary
- Same deal as for UK PhD students (and same level of funding)
- Small number of PhD places are supported but mostly research MScs
- Important to complete on time – funding and visa will generally run out at the same time
- Happy to talk individually about DARA projects for those thinking of applying

Postgraduate application

- Normally:
  - Select university/ies
  - Apply
  - Interview (only if funding available)
  - Speak to potential supervisors
  - Offer (or not)
  - Accept (or not)
- For DARA you apply through DARA, who will allocate you to a university and supervisor – then you formally apply to the university stating you have DARA funding

Projects and supervisors

- Choice of project and supervisor is very important
- Look for an active supervisor who is doing good research (for astronomy, look them up on ADS!)
- Ideally find out if the supervisor has a track record of successful supervision
- Choose a project that genuinely appeals to you: don’t just apply for anything
- A postgraduate degree can be a long haul – a good project and a good supervisor can make the difference between success and failure

Supervision/collaboration

- All sorts of styles of PhD supervision
- Can be just you and your supervisor
- Can be you and a huge collaboration with formal rules about projects, papers
- Or somewhere in between (e.g. external co-supervision)
- Much of the best science is being done in large collaborations
- If possible talk to supervisor about how this will work before choosing a project

Training

- All postgraduate study in the UK involves training as well as research
- Some ‘on the job’ research training – like these two weeks! – often by supervisor or postdocs/other students on the project
- Some formal training in lectures or practical classes (astro background, programming, data analysis, statistics)
- Usually compulsory but not assessed by exam (but varies from place to place)

Assessment

- MSc by research or PhD have to be a (significant) original contribution to research
- Content should be publishable
- Roughly MSc == 1 publishable paper, PhD == 3 publishable papers (but more better)
- In the UK you don’t have to publish (but you really should)
- In NL your work must be published before you can submit it for a PhD

Assessment (UK)

- Final assessment for a PhD or research MSc is a viva (formally viva voce examination)
- Intensive questioning by two or three academics who are experts in the area
- Can be a pleasant chat – or can involve stress, tears etc
- All being well you know more than your examiners do about your work!
- Almost everyone passes, sometimes corrections are requested first
- Supervisor should not let you submit a thesis that will not pass (so make sure s/he reads it)

What next? (academia)

- A MSc is training for a PhD
- A PhD (in Europe/US) is training to be a postdoctoral researcher (postdoc)
- 1-3 year staff positions working on a project, normally with a faculty supervisor
- Much more independent than a PhD – you can pursue your own interests (and you should!)
- When the money runs out you have to move on
- Completely international in scope – people move all round the world in search of jobs

What next? (academia)

- Permanent positions or long-term fellowships become possible after 2-3 postdocs
- Very competitive
- Need to be established as independent and a leader in your field
- Permanent positions involve teaching, administration, management… all taking you away from research. (But then you get to hire students and postdocs of your own!)

What next? (academia)

- You have to be lucky (as well as hard-working) to get a permanent position
- Be in the right place at the right time
- Work in topical areas or with new instruments
- New radio instruments a great opportunity!
- Very small fraction of starting PhD students will end up in academia in the long term

What next? (not academia)

- Physics/astro research degrees are valuable for other things too
- Demonstrates numeracy, literacy, analytic skills & a capacity for sustained hard work
- Valued by employers in technical, scientific, engineering, financial sectors – who generally pay better than academia
- OK to enjoy it while it lasts – then move on to other challenges