

Strategic advice for PhD students and postdocs

This document provides some advice to help you navigate the various stages of your early scientific career. These are suggestions, not rules or commands, and have to be used for inspiration. Please be aware that there can be large differences among majors (physics, mathematics, computer science), as well as between individual research fields (e.g., experiment vs. theory), so that every item may not necessarily be applicable to each field. You do not have to check off every single item. Remember you can always talk to your supervisor, peers and colleagues for more information.

The document is divided in three sections: A) for PhD students, B) for PhD students and postdocs willing to pursue an academic career, and C) for early career scientists trying to get a permanent position in academia.

A) For PhD students

In the following, we give advice for the chronological stages of your PhD.

Before Beginning: Take an informed decision.

You will work on your PhD for at least 3 years and since it is a significant amount of time you want to make sure you like the project. Get to know the group (including possibly former members) and their research field. Discuss your project and expected challenges with your supervisor. Ask about teaching duties, tasks and responsibilities you will have, as well as opportunities, e.g. for outreach events, courses, schools, travel etc.

Consult the following JGU links:

<https://www.zq.uni-mainz.de/wissenschaftlicher-nachwuchs/apk/>

<https://gleichstellung.uni-mainz.de/nachwuchswissenschaftlerinnen/prowein/faecheruebergreifendes-programm/>

Beginning: Read the general strategic advice for an academic career in B), even if you do not plan to pursue an academic career, it will help you to be successful as a PhD student.

Talk to your supervisor regularly.

After about 6 months: Make sure you understand the timeline of your project (which might depend on a big collaboration). Discuss this with your supervisor. In case your field allows for it, write a project description of your dissertation, including preliminary title, short introduction to the field and motivation, description of your research project, milestones and timeline, and a list of conferences, workshops or summer schools you would like to attend. The project description will be preliminary, and will most likely need to be adapted throughout the course of your PhD research. The initial aim should be to finish after 3 years. This is not always possible, in particular if experimental work is involved.

Every year: Set up a "PhD committee" and meet them once a year to present the progress of your work, receive feedback and advice for the continuation. This committee should consist of your supervisor and, potentially, other professors or members of your research group/institute. Discuss the timeline for the next year: planned publications, presentations at conferences and workshops, attendance of soft-skill courses, etc.

At mid term: Think about your long term plans: Do you want to work in academia or industry?

If you are planning to work in industry:

- try to get involved in projects, where you can learn transferable skills, e.g., experience in common programming languages, machine learning, artificial intelligence, big data. Visit also the career center of JGU: <https://www.career.uni-mainz.de>.

- Attend soft skills workshops.
- Consult these web pages:
 - <https://campus-mainz-mentoring.uni-mainz.de>
 - <https://www.dpg-physik.de/aktivitaeten-und-programme/programme/mentoring>
 - <https://www.dpg-physik.de/aktivitaeten-und-programme/programme/laborbesichtigungsprogramm>
- Learn to manage your time and work on several projects in parallel. These are skills that will be very precious in industry.

If you want to stay in academia:

- Make sure your supervisor knows it.
- Towards the end of your PhD studies (but potentially one year prior to finishing), start applying for postdoc positions.

Towards the end of your PhD studies: Start writing your thesis, it will take you longer than you think. To get help in the writing, consult these JGU links:

- <https://www.schreibwerkstatt.uni-mainz.de/wissenschaftlicher-nachwuchs/>
- <https://www.akin.uni-mainz.de/toolbox-st/>

B) For PhD students and postdocs willing to pursue an academic career

Stay informed:

- Sign up for mailing lists to learn about the latest research (choice is field-dependent):
 - <https://arxiv.org/help/subscribe>
 - <http://www.fg-stochastik.de/abonnieren.html>
- Register to the most relevant mailing lists of our faculty:
 - <https://lists.uni-mainz.de/sympa>
- Attend the relevant colloquia to keep updated with research in a broad sense:
 - <https://www.blogs.uni-mainz.de/fb08-pmc/colloquia/>
- Register at platforms where you can interact with other researchers and ask for publications that are not open-access or available on the arXiv, e.g.:
 - <https://www.researchgate.net>
- To stay informed about conferences, job postings, etc., use platforms like:
 - <https://inspirehep.net/?ln=en>

Strategize your work:

- Organize a work strategy for your project (or the projects that you work on in parallel). Time management and project planning courses can be useful.
- Keep a good documentation of your work. You will thank yourself later.

- Discuss with your supervisor and collaborators how you can publish your work. If your field allows, you can set yourself goals in terms of how many papers you want to publish during your PhD or Postdoc.
- Request a yearly meeting with your supervisor or your “PhD committee” to discuss objectives and future plans.
- Identify important conferences in your research field and try to attend them at least once. Due to the cycle of some conferences (every 2 or 3 years), this might require you to be able to show preliminary results at an early stage of your PhD or Postdoc.
- Show initiative and suggest projects on your own.

Plan your career:

- Be aware that in some fields application/hiring periods are only once per year. It may occur that the application period is in the fall, with offers being made at the beginning of the year and positions starting in the coming fall. This might require you to apply for positions before you obtained your PhD.
- Attend student conferences that organize sessions dedicated to career advice: e.g., Frontiers and Careers in Nuclear and Hadronic Physics <https://frontiers.mit.edu>.
- If you are a PhD student, ask your supervisor early enough about possible contract extensions beyond the 3rd year (if needed) or the possibility to bridge the time between PhD defence and start of the first postdoc position.
- Try to apply for funding that enables you to do a longer research visit at an international institute, or pursue projects independently of your supervisor, or buy the lab instruments you need for your research.
- Try to gain international experience (ask your supervisor for advice, in order to do so compatibly with your private life).
- Read the advice for postdocs in C).

Be visible:

- Presenting your work with talks is an essential part of your job. Use every opportunity to present your work (even preliminary results) and try to practice in local seminars, group meetings, DPG meetings, etc. You may request your supervisor or your group colleagues to rehearse your talk before an official presentation.
- Think of a way to emerge and get your work recognized within and outside of the collaboration. In some fields, this might mean, e.g., to obtain a single-author publication (if not possible, your supervisor/collaborators might allow you to publish conference proceedings as a single author). In other field, this might mean to obtain coordination responsibility in a big collaboration.
- Before your first publication, register at <https://orcid.org> to have a personal researcher ID.

- Set up a profile at the publication search engines relevant to your field, e.g., <https://inspirehep.net/?ln=en>. It should be easy for others to find your email address and get in touch with you.
- To enhance your visibility, you could even have your own personal webpage with your publications/teaching experience.

Enhance your CV:

- Keep your CV and research output list updated at all times, you might need it on a short notice.
- As a postdoc, your focus should be on research. However, if time allows, engage in teaching, organization of journal clubs, seminars, conferences, etc. This will give you valuable additional qualifications.
- If possible, get involved in co-advising students (BSc, MSc, PhD) that are on an earlier career stage. You will learn a lot yourself from teaching and advisory work. If possible, get some experience in writing reports about these works.

Improve your soft skills:

- Try to become an (associated) member of a graduate school: e.g., <https://www.mainz.uni-mainz.de>
<https://hgs-hire.de>.
- Take soft skills workshop on: Scientific writing, Grant writing, Time management, Project management. Check out websites where these are offered like: <https://www.prisma.uni-mainz.de/irene-joliot-curie-programme/>
- If you are not formally registered to a mentoring program, think about registering to one (e.g., Ada Lovelace, Pro Academia), or seek for informal mentoring by talking to your supervisor or to scientists you meet at conferences. Visit these useful web pages: <https://ada-lovelace.de/standorte/mainz/>
<https://campus-mainz-mentoring.uni-mainz.de>
<https://www.nachwuchs.uni-mainz.de>

Do networking:

- Create your own network of collaborators, colleagues, scientists you meet at your own institution and at conferences.
- When you go to a conference, always ask questions, and make sure you meet someone new.
- Talk to peers that do not do exactly the same work as you. You can learn a lot from each other.
- Be always prepared to present your work to non-experts in 2 minutes. Prepare an “elevator pitch” and rehearse it in front of the mirror or in front of some colleagues.

C) For early career scientists trying to get a permanent position in academia

Finding a new position:

- Discuss your project very clearly at the beginning of your contract/fellowship and make sure to bring in your own ideas.
- Keep the junior job postings in your field monitored, since they are not necessarily aligned to the postdoc application cycle.
- If you interview for a new position, ask also if (and how much) you will be allowed to continue working on your own projects.

Become independent and show you are ready:

- Invest time in expanding your net of collaborations.
- Enhance your visibility.
- If possible in your research field, try to achieve publications without your PhD supervisor as soon as possible.
- If possible in your research field, try to achieve a single-author publication.
- Get a broad overview of your scientific field, the so called “big picture”.
- Try to understand also challenges in personnel management and in the university politics.

Apply for external funding:

- Apply for individual funding as early as possible (1 year after PhD). You might (very likely) fail, but the feedback and experience you get will be invaluable. Get informed about all the options. JGU has a grant office <https://research.uni-mainz.de/research-funding/> with departments specialized on national, EU and international funding programs. Prominent examples are:
DFG: Walter Benjamin Programm, Emmy Noether Programm, Research Fellowships, Individual Research Grants, etc.: https://www.dfg.de/en/research_funding/programmes/index.html.
Helmholtz Young Investigator Groups: <https://www.research-in-germany.org/en/research-funding/funding-programmes/helmholtz-young-investigators-groups.html>.
Humboldt foundation: Feodor Lynen fellowship <https://www.humboldt-foundation.de/bewerben/foerderprogramme/feodor-lynen-forschungsstipendium>.
EU: Marie Skłodowska Curie Action, ERC, etc.: <https://research.uni-mainz.de/contact/eu-office/>, <https://www.kowi.de/kowi/horizon-europe/excellent-science/excellent-science.aspx>.
- Proposal requirements might largely differ between funding schemes. If possible, take a general course in grant writing, as well as funding specific courses.

- Find and read successful proposals to have good examples at hand.
- Prepare your proposal with the questions of your referee / funding agency in mind (originality, impact, feasibility, risk mitigation). The answers to the key questions need to be formulated very clearly, so that the referee can easily find them.
- Make use of services to proof-read your grant proposals and practice your application talks. Ask, e.g., the grant office, KoWi <https://www.kowi.de/kowi.aspx>, as well as your colleagues.

Finally, remember that these are only suggestions and that you do not have to check off all of them. There is not only one way to a successful career. Your passion will make the difference.

To add advice or give feedback on this document please email Prof. Sonia Bacca (s.bacca@uni-mainz.de).