

Careers

The good mentorship guide

Sarah Bohndiek describes some of the key traits postdocs should look for in a potential mentor and offers advice on selecting the right mentor for you

By the end of your PhD, you will have acquired an extensive range of technical skills and experience in scientific communication. You will likely know how to navigate the politics of working as a team and be able to critically evaluate scientific papers. You will also rank among the world's experts in your particular sub-field. In other words, you will have become an established scientist.

However, if you decide to go on an do postdoctoral research, you will quickly discover that you still have a lot more to learn. Becoming a group leader involves developing your own research programme; managing and mentoring others; successfully writing and administering grants; implementing good safety practices; and adopting successful time and project management strategies. None of these things are generally included in a PhD course. And regardless of whether your goal is to stay in academia or, in the longer term, move on to something else, these skills will serve you well. So how should you go about developing them during your time as a postdoc?

As I begin the transition from postdoctoral fellow to university lecturer, the one thing I know for certain is that I would not be where I am today without the commitment, guidance and advice of my former and current mentors. All of them have contributed to my success as a physicist, and the lessons they taught me about mentoring were some of the most important of all. I will try to summarize these lessons here by laying out what I believe are key trademarks of a good mentor and mentee; how postdocs should evaluate a potential mentor; and how to maintain long-term mentoring relationships.

What to look for

The mentor-mentee relationship is a two-way street, so we need to consider the relationship from both sides. First, if you are applying for a postdoc position, what are the most important attributes to look for in a potential mentor? For me, one of the greatest things a mentor can give to a



developing researcher is inspiration. The ideal mentor is someone who is so passionate about science that you can go into their office with your head down and a project that seems to be going nowhere, and leave with a smile and renewed confidence that it *will* work out.

Another key feature is generosity. This comes in two forms. The first is generosity with ideas: you want to find a group leader who is generous with their own scientific knowledge while also encouraging independence and creativity. But generosity with time is also important. A good mentor is someone who is always there for you when you need them – someone who makes time for regular one-to-one conversations despite busy schedules, and who provides support by phone or e-mail if they are not there in person.

Empathy and selflessness also rank highly in my list of desirable traits. A good mentor will treat postdocs with respect and will not regard them as just a “pair of hands”. They will celebrate your successes and take time to help you analyse and learn from your failures, while also keeping them in perspective. And of course, they will give you credit for your ideas in public and help you expand your network of contacts – both of which will help your future career prospects and promote your standing in the sci-

entific community.

In return for these things, a good postdoctoral mentee will bring a number of important attributes to the mentoring relationship. One of these is foresight. All of us have slightly different needs, so you should not expect your mentor to know automatically what you want or need from the relationship. It is your responsibility to think carefully about these and ask for them specifically.

Similarly, if you are bringing a problem to your mentor, make sure you are proactive enough to consider possible solutions beforehand. Don't expect to be “spoon-fed” answers, and make it clear that you value your mentor's time by making (and keeping!) appointments and staying focused on the important points that need to be addressed. Finally, a good mentee should be able to strike a balance between ambition and humility. For example, that might mean setting goals with your mentor that they can help you achieve (whether scientific or career-driven), but also being willing to accept constructive criticism (see March pp69–70).

Interviewing the interviewers

The obvious follow-up question is how you, as an aspiring postdoc, can determine whether a potential mentor meets these

criteria. The most important advice I can offer here is to interview them! It is likely that you will visit your prospective group, so while you are there, you should talk to other members. Find out about their experiences with the group leader and be sure to ask them tough questions about how new ideas are discussed within the group and what networking opportunities they have been given. If the mentor is a high-profile researcher, you should also ask how often they are available to their group. Passion is a bit harder to judge, but impassioned mentors are often excellent and inspirational teachers and great communicators to diverse audiences. Try to find out if your potential mentor fits into this category.

Finally, remember that it is rare to find all of the attributes I have identified in one individual. After all, academics are chosen on the basis of their research success, rather than their ability as leaders or mentors, and they often receive little or no training in the latter roles. If your group leader lacks one or more of the attributes described above, do not be afraid to look to others in your department or even collaborators at other universities to serve as mentors as well.

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Foster relationships with people you identify as potential mentors and ask them if they would be willing to provide additional guidance in a particular area. Do not be disheartened if they say “no”, as they may simply have too many mentees and feel that they cannot provide you with sufficient attention. Keep looking! Peer mentors in your research group can also be an excel-

lent source of support, especially if you are changing fields of research. Ask a fellow postdoc to mentor you as you learn a new technique or software tool.

A good mentor will be instrumental in your future success long after you have left their group, so once you have established a strong relationship that works well, treasure it. Work hard to keep past mentors up to date with your progress; for example, by sending an annual e-mail report if you are not in regular contact. Also, be sure to watch the progress of their research. Great mentors will help to build your career as you move from junior mentee to established independent researcher and potential collaborator. Their advice will be invaluable. Keep in mind that a strong postdoctoral mentor can be the difference between success and failure in an academic career. Take your time, interview them as they interview you, and choose wisely.

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Once a physicist: Andreas Schleicher



Andreas Schleicher is the deputy director for education and skills at the Organization for Economic Cooperation and Development

Why did you decide to study physics?

I have always been fascinated by the search for universal laws and principles that help us understand and act in this complex, volatile and uncertain world in which we live. And there is probably no other field of study that opens up so many interesting and different life chances than physics.

Did you enjoy studying it at university?

Definitely, and I had truly inspiring professors. But I was also fortunate that, from my very first years at the University of Hamburg onwards, I always found interesting opportunities to apply what I learned in research and product development.

Generally, I think universities can do better in integrating the world of learning and the world of work.

How did you get involved in education research?

I got my first job in educational research (at the International Association for the Evaluation of Educational Achievement in the Netherlands) because of my efforts to make complex educational issues amenable to quantitative analysis. In other words, I was successful because I was able to apply the paradigms and research methods of physics to the world of education where these were generating new insights. I learned a lot from this. Conventionally, our approach to physics in university classrooms is to break problems down into manageable bits and pieces, and then teach students how to solve them. But in today's world, we create value by synthesizing the disparate bits. This is about curiosity, open-mindedness and making connections between ideas that previously seemed unrelated – all of which requires being familiar with and receptive to knowledge in other fields than our own. If we spend our whole life in a silo of a single discipline, we will not gain the imaginative skills to connect the dots to where the next invention will come from.

What's the most surprising thing you've learned in your research over the years?

When I started my career, many educators still

held the belief that education was a unique personal experience, that schools were entirely shaped by their social context and that education systems were operating in unique cultural contexts. Today, the Organization for Economic Cooperation and Development's Programme for International Student Assessment (PISA) surveys are able to statistically account for 85% of the performance variation of schools in the industrialized world. The field of education has learned to develop data and propose explanations, and to recognize key features of scientific investigations and the types of answers one can reasonably expect from science.

If you could change one thing about the schools in France, where you're living now, what would it be?

In French schools, teachers are often left alone in classrooms with a lot of mechanic prescription of what to teach. A modern enabling education system sets ambitious goals, is clear about what students should be able to do, and then provides its teachers with the tools to establish what they need to teach to their individual students. The past was about delivered wisdom, compliance and conformity. The future is about user-generated wisdom, being ingenious and personalizing educational experiences.

Has your background in physics helped you?

Yes – every day!