

Some Important Advice for and Expectations from New Students and Postdoctoral Researchers

You determine success: Your mentor can only set up a research opportunity and provide feedback along the way. What you do with it is essentially up to you. Don't expect your mentor to tell you what to do from the beginning until the end of your studies. After a certain point, the ideas, the implementations, the papers, and the success will be primarily because of your talent and hard work.

Learn on your own: The activities in the group cover a broad range of numerical analysis, computational mathematics, computational fluid dynamics, numerical PDEs, and simulation sciences. However, these large areas are also a vast, fast-moving field. Don't expect your mentor to know everything. Read and learn on your own. Attend seminars and conferences, talk with your colleagues, read papers, follow references. Once you know a few new things about a topic, teach your advisor and project mates about it.

Show initiative: Many students and young researchers can execute a task once they are told what to do step by step exactly. However, students and young researchers who excel are active participants in a research group. Those who ask questions, offer replies, suggest new problems to work on, come up with innovative solutions to problems, spend extra time trying to analyse and verify the results of an experiment. Don't sit back and wait to be told what to do. Be active. You may ask a "stupid" question or suggest a "bad" idea now and then. Be bold and try innovative and challenging ideas that might seem difficult or impossible (unless proven rigorously). It is a natural part of the learning process and, in fact, a central element of research.

Work in a group project: Few great research ideas can be handled by a single person these days. Many students and young researchers have a hard time working in groups. They don't like sharing their new ideas or mistakes with others and have general insecurity about who gets credit for what. Make your colleagues in the group an asset instead of a problem. If you are a good team player, you can benefit significantly from group interactions and even direct collaborations. In addition, the influence of the other team members will become a source of inspiration for you. Finally, you will make some good long-lasting friends that will be very helpful in the future, no matter what you do next.

Be broad: Some students and young researchers tend to rush to overspecialize in a niche research domain. While this may seem the fastest way to get to results, you should try to resist the temptation. The importance of your research topic and the impact of your thesis will be much higher if you have a broad understanding

of your research domain. Don't just take classes in computational mathematics. Take classes in pure math, physics, biology, computer science, etc. Don't just attend seminars or talk just to students and faculty specializing in one field.

Be organized: Organize your work to achieve short-term (daily, weekly) and long-term (monthly, yearly) goals. Your time is a precious commodity. Use it smartly. In addition, keep good notes of the ideas, issues, and bugs you run into. It is the best way to avoid duplicating work and to have a head start on all papers, reports, etc.

Be honest about your work: The worst thing you can do is ruin your reputation as a student or researcher. Be honest when you promise to deliver something (result, paper, etc.). Be honest when you present your research accomplishments. It is easy to be dishonest with both and get away with it in the short term. However, your mentor and colleagues will eventually catch up with you and, once your reputation is damaged, it will be difficult to recover.

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