



Research Methods in Science in Engineering

## Choosing a Research Mentor/Advisor

Slide 1

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## Lecture Outline

- What to look for in an advisor.
- How to ask them to be your advisor.
- What about switching advisors?

Slide 2

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## What to Look For in an Advisor

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## The New Faculty



### **Benefits:**

Young faculty are energetic, motivated, and will generally invest the most amount of time in their students.

### **Drawbacks:**

Young faculty are not yet established. They will have less funding, their labs will be less well equipped, and they will have fewer learning materials. They are less well-connected and do not yet have a reputation when helping you find a job. They may also fail, not get tenure, etc.

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## The Old Faculty



### Benefits:

Older faculty are more well established, have better equipped labs, offer a more dependable funding stream, and offer more recognition and connections when looking for a job.

### Drawbacks:

Older faculty have less energy, are more distracted with administrative duties, and will generally spend less time with their students.

## The Ideal Mentor/Advisor



- Working in an area that you like.
- Full of energy and motivation.
- Is a rising star.
- Well-funded and produces many publications.
- Has a well-equipped lab with some more experienced students around.
- Well-liked and connected around campus.
- Is well-connected in the industry and has a strong reputation.
- Offers holistic training to their students (i.e. research, teaching, career coaching, etc.)
- Good personality fit with you.

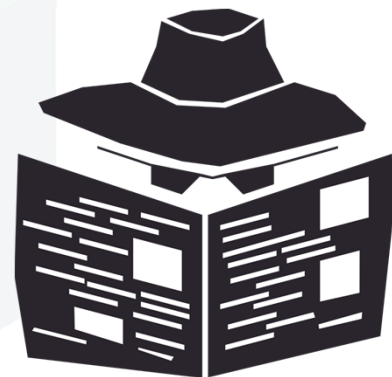
Try to find a motivating young faculty member who is a rising star!

## How to Ask Them to Be Your Advisor

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### Learn About the Advisor **Before** Contacting Them

- Ask around about the advisor
  - Do students like them?
  - Do they have any active grants?
  - Are they active in research?
- Review their research website
  - Does their research interest you?
  - Are they actively publishing?
  - Do their websites convey ambition and activities outside of research?



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## Why a Professor Would Not Hire You

Taking on a new student is a HUGE commitment and a HUGE risk.

- The professor likely does not know you, so you are a risk.
- The professor likely does not have any immediate funding for you.
- A research student is around a five-year commitment.
- It typically takes two years of intense training before a student is productive in the lab. In the meantime, the professor must deliver on the research so their workload doubles in order to take you on.
- One bad personality can ruin a group.



## Best Way to Approach a Professor

If the first words from your mouth are “do you have any research positions available,” expect to get a “no” response. See previous slide.

Instead, ask for a meeting to learn what it is like to work in their field.

Do some research on your own. Ask for their advice or ask a technical question.

Some time later, ask about volunteering in their research lab.

You are demonstrating passion and commitment.

You are giving the professor time to get to know you better.

When a funding opportunity arises, you will be first on their list.

## How to Get into a Group at Another University

1. Learn about that research group online.
  1. What topics do they research?
  2. What tools and methodologies do they use?
  3. What have they published?
2. Read their papers.
3. Learn their tools and methodologies (wherever possible)
4. Do some research on your own.
5. Reach out to ask some technical questions or to ask what it is like to work in that field.
6. Keep researching and occasionally (~once per month) reaching out to ask a smart technical question that demonstrates you are passionate, hard-working, and making progress.
7. When you think you have a good working relationship, mention you are looking for research opportunities in this field. Ask if they know of any.
8. Avoid putting the professor "on the spot."

## Switching Advisors

## Pick a Good Advisor from the Beginning

- Switching advisors is possible, but is riddled with problems.
- It is critical to pick a good advisor from the very start so that you do not have to switch.
- Be wise when picking your advisor.



## Problems with Switching Advisors

- There is an unwritten rule in academia that a faculty should never take a student from another faculty.
- Your topic may not be in their area of study. Advising a PhD is a huge amount of work, and it is most strategic for faculty to stay focused in their area of expertise.
- You may already have some results or ideas that belong to the previous advisor. This presents ethical problems.



# How to Switch Advisors

- You absolutely must talk to your current advisor first.
- The current advisor should be the first to approach the new advisor to clear the way.
- You must get a new research plan in place.
- Be prepared to start over in a new area of research or take on additional tasks.
- If you are near the end of your PhD, I highly recommend staying with your current advisor and seeing your degree through.

