

Research Statements

Elisabeth's personal advice on Do's and Don'ts

Preface

- In the US and Canada, there's main postdoc job season: Institutions have agreed that the earliest decision deadline for offers in February 15. Job ads start appearing at the end of summer, with application deadlines in ~October - December. All the big fellowships follow this cycle.
- Some postdoc positions may appear throughout the year, typically related to specific funded projects.
- Many (non-fellowship postdoc positions will be a mix of independent research and research that aligns with the funding source - be open-minded when looking at such job ads, your previous research doesn't need to be a 100% match!

General

- 1) 4 whys: Why this? why you? why now? why the place you are applying to?
- 2) Do have an intro paragraph that covers the first 3 whys
- 3) Do have good plots (1 per topic or per point you want them to remember)
- 4) Do understand your career state: It's different if you apply for 1st PD, 2nd PD, and beyond
- 5) Do understand your audience
- 6) Don't sell yourself short
- 7) Don't make stuff up
- 8) Overall guidance: Write a research statement that you are proud of (do not distort your research trying to guess what the other side wants to hear)

4 Whys

- 1) Why this project?
Explain your research (big picture)
- 2) Why you?
Explain what prepares you to solve this problem and what makes you special
- 3) Why now?
Explain why this is an interesting problem now as opposed to far in the future or outdated.
- 4) Why the place you are applying to?
Explaining why you want to go to this place and why it's special to you - this connects to 2)

The first 3 whys should be in the intro paragraph and then echoed in the text. The 4th can be part of the summary.

Intro Paragraph

- The first 3 whys should be in the intro paragraph and then echoed in the text. The 4th can be part of the summary.
- The intro paragraph needs to contain everything that you want the reader to remember, **but not more**.
- This paragraph will be re-read shortly before the panel discusses shortlists
- If it's too short then the strongest arguments for hiring you will be missed in the discussion
- If it's too long it will be confusing for the panel and you are out just because it was confusing
- This is a sales pitch... you need to give whoever supports you in the panel the ammunition to convince the others. Complexity is your enemy... keep it simple

“Money plots”

- Do not make plots too complex. They should convey one point per plot and that point must be understood immediately when looking at the plot, e.g.,
 - “My measurement is better than anything that was before”
 - “With this new dataset we can finally answer this super-important question”
 - “I have measured this already”
 - “This is a longstanding problem that has bothered a large fraction of the community”
- Write nice snappy captions that advocates in the selection panel can use
- Make sure the plot is perfect and has good axis labels (simple to understand), colors, resolution, shows up great in pdf etc
- Your research statement must be understood by just reading the money plots and the intro

Understand career state

- 1st PD application: Selection committee is more willing to take chances; you can be somewhat bold/extrapolate and say what you want to do. Everyone gets that you are not yet fully developed as a scientist.
- 2nd PD application: You have to demonstrate that you are on track for becoming a leading researcher and that you are moving towards a unique research profile; you have to show both leadership, productivity, independence, and a unique skillset
- There's lots of stuff inbetween
- Faculty: You are now fully developed and need to show that you are a leader in your field, that you are fully independent in developing and leading projects and students and that you have a vision for the future of the field; you also need to have a plan to get money (best demonstrated if you already got some), student projects (show that you mentored students successfully already); you cannot add new ideas and directions to your research anymore; people will want to see that the track you are on is the future the institute should invest in.

Understand your audience

- Selection committees for PDs can be like your mentors, your group, or people you talk to at conferences. Frequently PD applications are successful because you talk to someone in your field who then knows you or your advisor.
- Selection committees for fellowships are all over the place, but somewhere in between personal PD and faculty. They are like faculty in the sense that your work needs to stand out not just in your field (e.g. baryons for cosmology) but more broadly. They are like personal PDs in the sense that people are willing to give you the benefit of the doubt if you talk about speculative ideas
- Selection committees for faculty **are not** like your mentors, your group, or people you talk to at conferences. You need to convince a selection committee that spans all areas of astro that the institute should invest a significant amount of money and resources in you and your strategic vision. Go back and read the 3 whys carefully. Do not talk small details or highly speculative ideas that you have not worked on.

Don't sell yourself short - Don't make stuff up

- **For those who are overly humble and point out their own weaknesses:**
Applications are not the place for humility; do not talk about weaknesses go back to the whys and focus on positivity.
- **For those who are bold/smooth talkers:**
 - Be careful not to give the impression that you are bragging (which is different from you yourself thinking that you are bragging).
 - Be mindful that if you can't back claims from your research statement up (letters, papers+citations, interviews) that is a **major** disadvantage

Overall guidance: Write a research statement that you are proud of

You will never be able to anticipate what a committee is looking for... there is a large element of uncertainty.

I recommend to write something that you are happy with even if you are not selected. Something that lets you say:

“Well, this is me and my research and I wrote it up really well; if you as an institution can't see that it's great, that's your problem.”

About AI

Use of AI in application has become extremely common, but often at loss of originality. In graduate school admission at the University of Arizona, we found that we can't really use applicants' statements anymore as they have become too polished and generic.

As you advance in your career, your own ideas are a main part of what sets you apart from other applicants (or AI agents)! Hence it is essential that your own ideas shine through in your research plans/proposals. Of course you can use modern tools to improve language, but I would strongly recommend writing the whole statement in your own words first.

To write clearly, you have to think through your project idea much more deeply than to write a few LLM prompts. The difference is easy to tell, especially in interviews...