GAAP

Session 2 | July 3, 2025

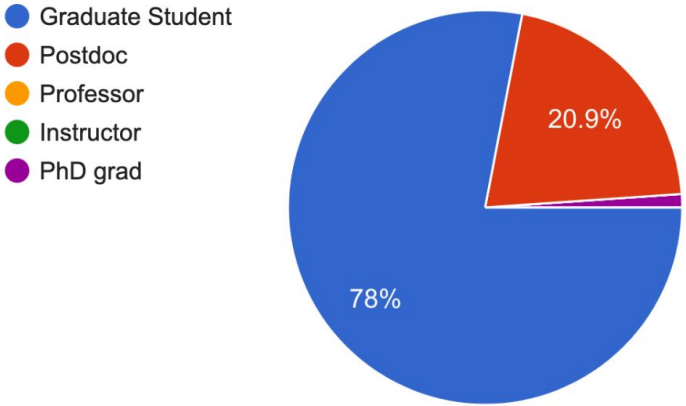
Writing Your Research Proposal

Speakers: Eric Koch & Jess Speedie
Slides by: Jess Speedie, Emily Deibert & Eric Koch

FYI (For Your Interest)...

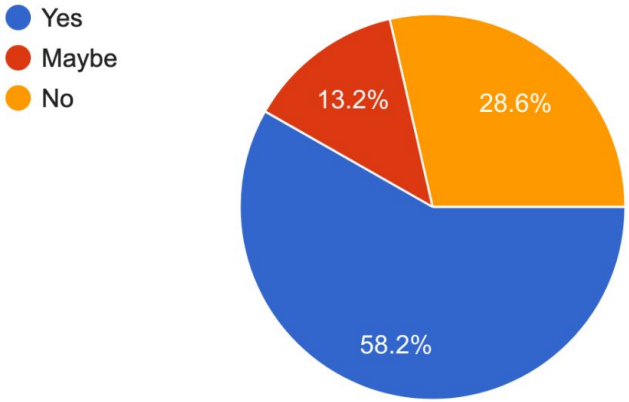
What is your current position?

91 responses



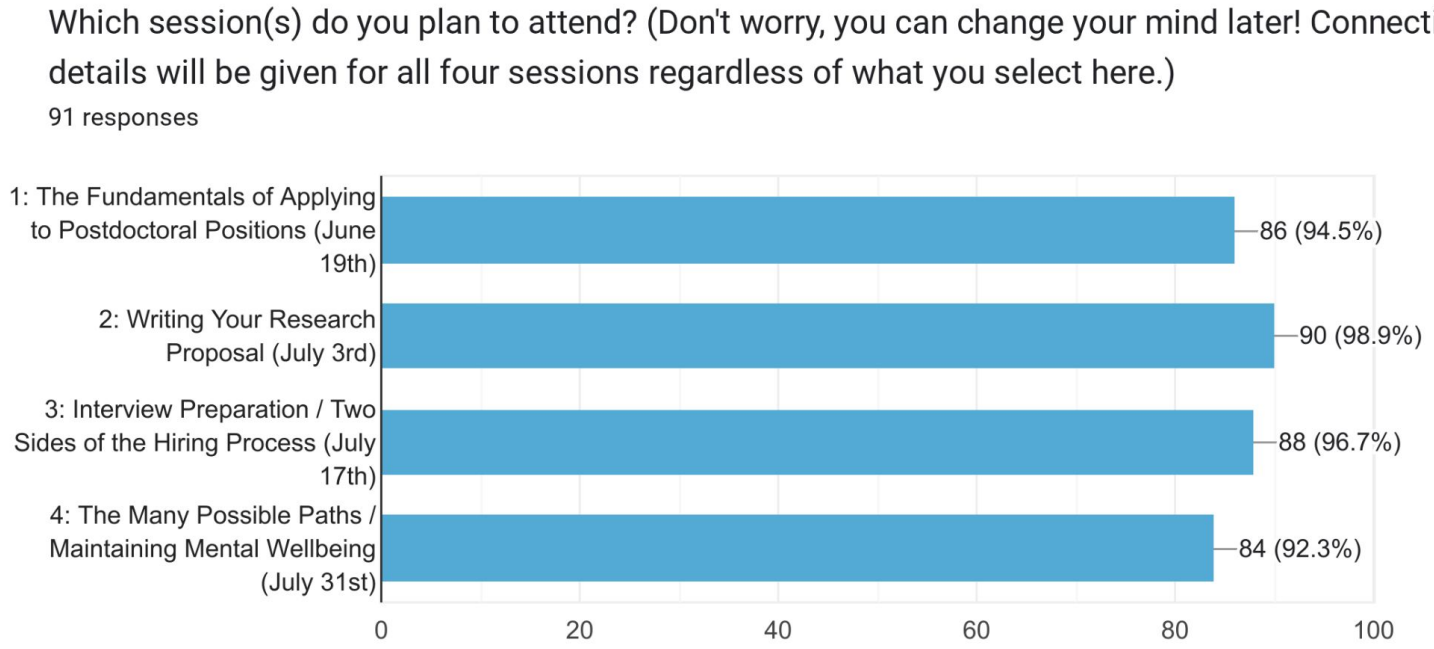
Are you looking to be "on the postdoc job market" in Fall 2025?

91 responses



(As of July 3)

FYI (For Your Interest)...



(As of July 3)

Introduction & Disclaimers

Eric Koch
SMA & NSERC Fellow, CfA | Harvard & Smithsonian → Assistant Scientist - ngVLA, NRAO
Invited Speaker

Jess Speedie
PhD Candidate, University of Victoria → 51 Pegasi b Fellow, MIT
CASCA Graduate Student Committee

Emily Deibert
Science Fellow, Gemini Observatory/NSF's NOIRLab → Banting Fellow, University of Waterloo
CASCA Postdoctoral Committee

Adrien Hélias
PhD Student
Western University
CASCA Graduate Student Committee

Learn about the CASCA **Graduate Student Committee** (GSC): https://casca.ca/?page_id=279
Learn about the CASCA **Postdoctoral Committee** (PDC): https://casca.ca/?page_id=14828

Introduction & Disclaimers

Where does the information in these slides come from?

- Our ***personal experiences***, and those of our colleagues
- Advice we received from supervisors and mentors
- Astronomy Mentorship Program for Upcoming Postdocs (AMP-UP)
  - https://amp-up.space/index.html
- Taylor Hutchison's Postdoc Job Cycle Guide
  - https://aibhleog.github.io/job-cycle

Additional Resources

- https://astrobites.org/2022/08/02/guide-to-postdoc-apps-part1/
- https://astrobites.org/2022/08/03/guide-to-postdoc-apps-part2/
- https://jobregister.aas.org/postdoc-application-guidelines
- https://www.astrobetter.com/wiki/Talk+Series+for+Early+Career+Researchers
- How to Craft a Well-Argued Proposal: https://www.discovermagazine.com/the-sciences/unsolicited-advice-xiii-how-to-craft-a-well-argued-proposal
- More on Taylor's website: https://aibhleog.github.io/job-cycle

And of course, Sessions 1, 3 and 4 of this GAAP series!
https://cascagsc.github.io/gaap2025/

The plan for today's workshop...

1. Components of an Application
2. Basic Overview: Research Statements & Proposals
3. Qualities of a Strong Research Proposal
4. Figures in a Research Proposal
5. Project Selection & Development
6. How & When to Start Writing
7. Some Big-Picture Philosophy

Break :)


Components of an Application

Typical components of an application

1. Cover Letter
2. Research Statement (Interests, Previous & Current Work)
3. Research Proposal
4. CV
5. Reference Letters (x3)
6. Possible additional things:

- ❏ DEI Statement
- ❏ Abstract of your PhD Dissertation
- ❏ Copies of select publications / List of Publications
- ❏ Rationale for proposed institution(s) [for Fellowships]

Typical components of an application

1. Cover Letter (typically 1 page)
2. Research Statement (Interests, Previous & Current Work) (2 to 10 pages)
3. Research Proposal (2 to 10 pages)
4. CV (2 to unlimited pages)
5. Reference Letters (x3) (~5 pages each)
6. Possible additional things:

- ❏ DEI Statement (typically 1 page)
- ❏ Abstract of your PhD Dissertation (typically <=1 page)
- ❏ Copies of select publications / List of Publications (unlimited)
- ❏ Rationale for proposed institution(s) [for Fellowships] (~1 page)

Sometimes combined

Cover Letter

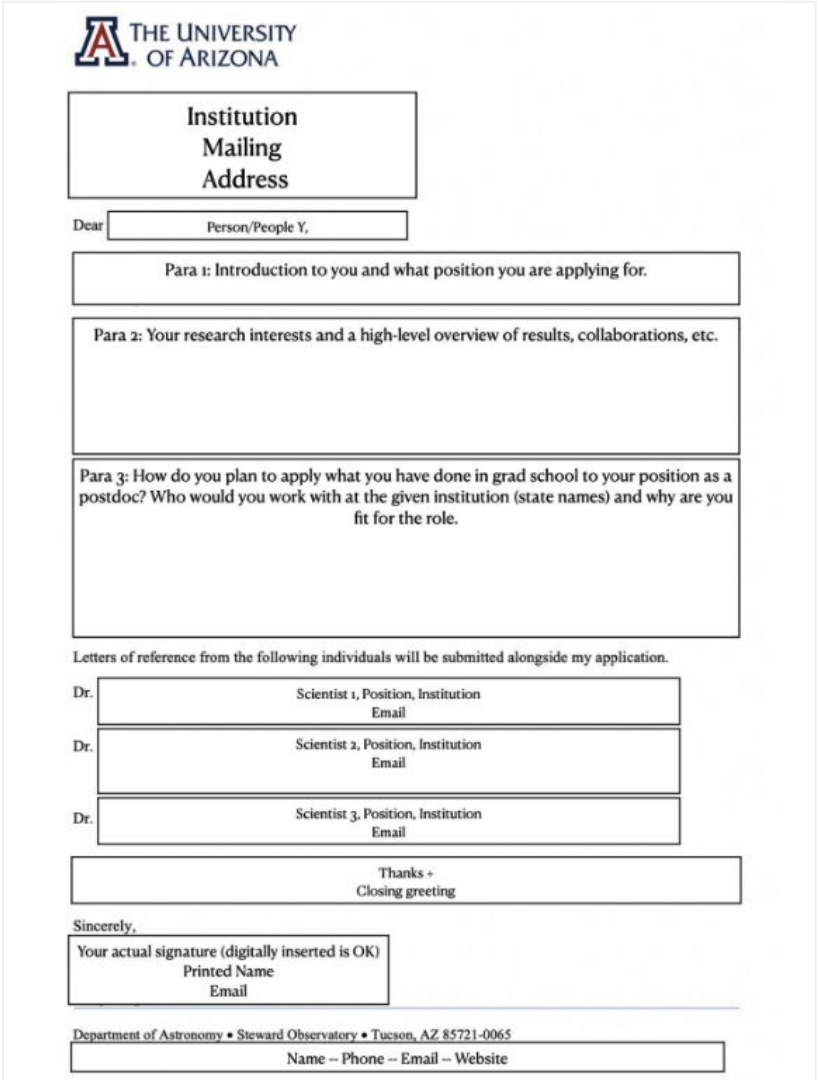
- ❏ Should express **excitement** about the job; draw the reader in and make them want to read the rest of your proposal
- ❏ Rationale for proposed institution(s) – why does your research fit here?
- ❏ Header and/or footer, to/from contact information, official logos
- ❏ Succinct and to the point
- ❏ Sometimes the job ad asks for specific information about you as an applicant to be included, otherwise it's up to you
- ❏ General cover letter templates: https://www.overleaf.com/latex/templates?q=cover+letter

Cover Letter: Examples

Cover Letter Template

University of Arizona

https://career.arizona.edu/resources/cover-letter-writing-guide/



THE UNIVERSITY OF ARIZONA

Institution
Mailing
Address

Dear Person/People Y,

Para 1: Introduction to you and what position you are applying for.

Para 2: Your research interests and a high-level overview of results, collaborations, etc.

Para 3: How do you plan to apply what you have done in grad school to your position as a postdoc? Who would you work with at the given institution (state names) and why are you fit for the role.

Letters of reference from the following individuals will be submitted alongside my application.

Dr. Scientist 1, Position, Institution
Email

Dr. Scientist 2, Position, Institution
Email

Dr. Scientist 3, Position, Institution
Email

Thanks +
Closing greeting

Sincerely,

Your actual signature (digitally inserted is OK)
Printed Name
Email

Department of Astronomy • Steward Observatory • Tucson, AZ 85721-0065

Name -- Phone -- Email -- Website

Cover Letter: Examples

Example by Taylor Hutchison: https://www.overleaf.com/project/61a6aac8f00ff09c6d8e86a9


Name of Institute
Month Day, 20XX
address line 1
city, state zip-code

Dear Search Committee,

through the American Astronomical Society Job

work].

research group].

do at the Institute 1]

Cover Letter: Examples

Example by Jess Speedie

To [address]

From [address]

Date

Dear Members of the Selection Committee,

I'm delighted to be writing to express my strong interest in Name of job At location. As a PhD candidate in astronomy at University under the supervision of Supervisor I have focused my research on Research topic Research topic. My interests revolve around Research pursuit

Research pursuits and methodologies/skills

My observational expertise lies in

Describe expertise
Describe the impact your research has had

My wider background has been shaped by a combination of theoretical and computational ap-

More expertise
Brief history and pre-existing connection to employer

I recognize the Name of job as the best opportunity to develop my expertise in the environment where I ultimately aim to build a career. I believe I would integrate seamlessly into the vibrant research environment of the Institution/department

Describe why you are interested in this job, specifically

How you and your research will contribute to the institution/department/employer, furthering their goals

Thank you for your consideration.

Sincerely,

Your name

CV

- Spend **a lot of time** reading **a lot of other people's public CVs** to understand what it feels like to be the person *reading* the CV
  - E.g. from the perspective of a [tired and short on time] hiring committee member
- How easy is it to glean the important information? What about the CV makes it easy or difficult?
- What are the common ways that information is organized and presented?

CV

- Spend **a lot of time** reading **a lot of other people's public CVs** to understand what it feels like to be the person *reading* the CV

Important caveat: Note that what appears on someone's *public* CV may not be the same as what they put on their [competitive] job application CV.

- What are the common ways that information is organized and presented?

Reference Letters

These are not one-pager, “I approve of this person” short statements. No. These are five-page essays*. These are full-on storybooks.

* With the caveat that this may vary with cultural norms

Reference Letters

- To the best of your ability, share your draft application materials with your references ~2-4 weeks ahead of the deadline
  - You want them to have time to craft a letter that best compliments your application!
- Let your references know who you want to work with at each particular institute, so they can work this in
- It's OK to give your references some guidance for the letter!
  - E.g., if you want them to touch on something particular, let them know!
  - Some may even ask this of you
- See also our GAAP Session 1 recording for tips on this!

DEI Statement

Note: Text on this slide is verbatim from the 2024 application guidelines for the 51 Pegasi b Fellowship

A DEI statement is an opportunity for applicants to:

- ❏ **Demonstrate** you have personal experiences, professional skills, and/or willingness to engage in and lead activities that will advance the diversity, equitable treatment, and inclusion of individuals from groups which have been historically underrepresented or excluded from the field
- ❏ **Offer** thoughtful and specific/concrete ideas regarding DEI in the field

https://www.hsfoundation.org/programs/science/51-pegasi-b-fellowship/

DEI Statement

Note: Text on this slide is verbatim from the 2024 application guidelines for the 51 Pegasi b Fellowship

Issues you may wish to address in a DEI statement include:

- ❏ Your **understanding** of the barriers that exist for historically underrepresented groups in academia and/or your field (e.g., women, minoritized racial/ethnic groups, LGBTQIA, people with disabilities, low social economic status, etc)
- ❏ Any programs for underrepresented communities that you have **participated in**, and/or any **commitments** to working toward achieving equity, expanding inclusion, or enhancing diversity
- ❏ Your long-range career **plans and goals** for advancing DEI in the field and **evidence** of activities or commitment to date that supports this intent

https://www.hsfoundation.org/programs/science/51-pegasi-b-fellowship/

DEI Statement

Note: Text on this slide is verbatim from the 2024 application guidelines for the 51 Pegasi b Fellowship

Issues you may wish to address in a DEI statement include:

- ❏ How you **plan** to contribute to DEI as a postdoc, including activities you would pursue and how they would fit into your research area, department, campus, or national context
- ❏ Be as **specific** as possible about the context, your role, scope, and impact. For planned activities, be **realistic** about your level of effort and time commitment
- ❏ Your background, interests, formative experiences, major challenges, sources of inspiration – anything that is **not already covered** in your application materials that informs your approach to DEI

https://www.hsfoundation.org/programs/science/51-pegasi-b-fellowship/

DEI Statement

Note: Text on this slide is verbatim from the 2024 application guidelines for the 51 Pegasi b Fellowship

Some background information about DEI and broadening participation in science in the US can be found via:

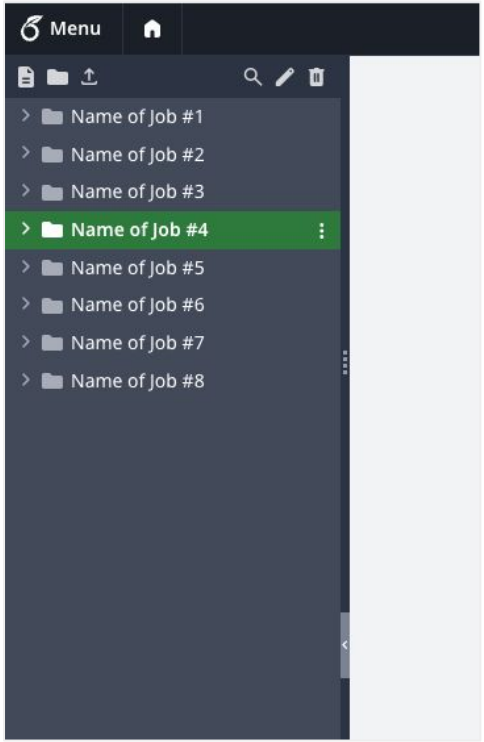
- National Science Foundation's Women, Minorities and Persons with Disabilities Annual Report: ncses.nsf.gov/pubs/nsf19304/
- National Academies various reports on diversity in STEM fields: www.nap.edu/collection/81/diversity-and-inclusion-in-stemm
- Nature Astronomy Focus: Gender Equity in Astronomy: www.nature.com/collections/wmzzzfjpyz
- Nature News Article: www.nature.com/articles/d41586-019-00655-3
- AAS's Committee on the Status of Minorities in Astronomy's Resource Page: aas.org/comms/csma/resources

https://www.hsfoundation.org/programs/science/51-pegasi-b-fellowship/

Other possible additional components

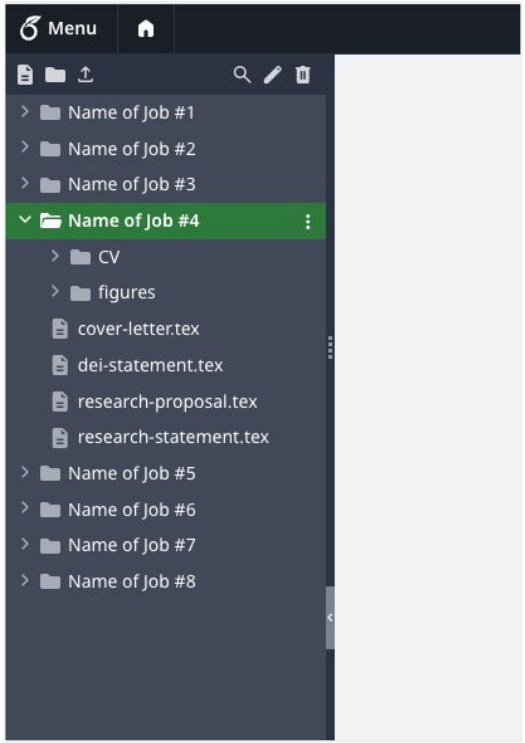
1. Abstract of your PhD Dissertation
   - ❏ If you don't yet have one, well, create it!
2. Copies of select publications / List of Publications
   - ❏ A list of publications should appear in your CV, but sometimes it's required as a stand-alone document (~1 page, or unlimited pages)
   - ❏ Some applications may ask you to create this directly on ADS
3. Rationale for proposed institution(s) [for Fellowships]
   - ❏ This may be a stand-alone document (~1 page)
   - ❏ Or you may work this into other components of your application

Organizing application materials in Overleaf



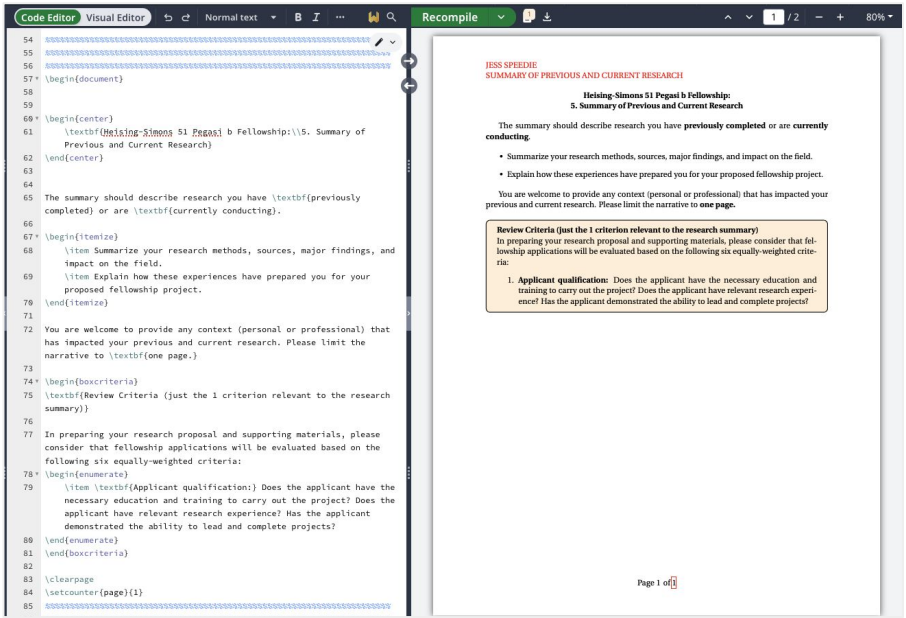
- All application materials drafted inside one Overleaf project called **POSTDOC APPLICATIONS 2025**
- Inside this Overleaf project, have one folder for each job application

Organizing application materials in Overleaf



- Inside one of the job application folders, have separate .tex files for each application component (e.g. cover letter, research proposal, etc)
- Also have subfolders containing figures for the research proposal/statement, and for this specific version of your CV (if CV is compiled as a collection of .tex files)

Organizing application materials in Overleaf



- For each application component, **copy and paste the job ad formatting specifications, rubric, or selection criteria onto the first page** (so that it compiles *into the document*)

- You'll be surprised at how helpful this is – it serves as a constant reminder of what the document should accomplish, and automatically orients anyone you share the PDF draft with

Basic Overview:
Research Statements & Proposals

Research Statement vs. Research Proposal

Research Statement

- ❏ Narrative writing
- ❏ Chronological recount of your research and its impact
- ❏ How you collected your skills and expertise
- ❏ Becomes a “biographical sketch” in more senior job openings

Research Proposal

- ❏ ***Persuasive*** writing
- ❏ Making an argument and supporting it with evidence
- ❏ Focuses on a future research program
- ❏ All discussion of past research is in service of your ability to carry out your proposed research

In brief: A Research Statement

A.K.A. Summary of Previous and Current Research, Research Interests & Experience…

- ❏ It's about you as a researcher
- ❏ Conveys that you have the skills, independence and initiative to successfully carry out your future research
- ❏ How are you uniquely qualified?
- ❏ What sets you apart in your field?
- ❏ What is the importance of your work to astronomers both inside and outside of your field?

In brief: A Research Proposal

- It's about your **future work**, and how well **you can deliver**
- Can you write a **well-reasoned**, **forward-thinking** research program that spans multiple years?
  - One to three well-considered projects is better than a "grab-bag" of smaller individual/disparate efforts
- Shows that you can develop an **independent research plan**, rather than relying on your supervisor
  - Ambitious, but balanced – needs to be accomplishable in ~3 years
- Also demonstrates that you have the **persuasive writing skills** necessary for writing **grants**


Qualities of a Strong Research Proposal

Note: Text on this slide is verbatim from the 2024 NHFP rubric

Example Rubrics: NHFP

Proposed Scientific Research (45%)

The proposed research program is the **most important element** in an application for an NHFP fellowship. NHFP Fellows are chosen primarily for having made a **cogent**, **persuasive case** for an important scientific research program that will advance the frontiers of astrophysics, with potential for lasting impact.

Proposed Scientific Research (45%)	[+]
Preparation and Past Research (30%)	[+]
Leadership Potential (25%)	[+]
Golden Buzzer	[+]

https://www.stsci.edu/stsci-research/fellowships/nasa-hubble-fellowship-program/announcement-of-opportunity/nhfp-selection-rubric

Note: Text on this slide is verbatim from the 2024 NHFP rubric

Example Rubrics: NHFP

Proposed Scientific Research (45%)

5: The proposed science is compelling, or even ground-breaking, and clearly described. The technical path forward is well-outlined and seems achievable during the fellowship.

4: The proposed science is important, relevant, and well-described. Some questions may remain about the impact of the proposed research or the certainty of achieving all of the stated goals within the fellowship period.

3: The proposed science is interesting and reasonably clear, but either not compelling, or the likelihood of achieving the stated goals within the fellowship period seems low.

2: The proposed science is poorly-focused or redundant with existing work and lacks either strong arguments for its scientific merit, or a clear path to useful results.

1: The proposed science is discussed only superficially or is not within the purview of NASA astrophysics.

https://www.stsci.edu/stsci-research/fellowships/nasa-hubble-fellowship-program/announcement-of-opportunity/nhfp-selection-rubric

Note: Text on this slide is verbatim from the 2024 51 Pegasi b rubric

Example Rubrics: 51 Pegasi b

Four of six equally-weighted criteria (66%)

- **Research significance to the field:** Does the research address an important problem or a critical barrier in planetary astronomy? Will meeting the science objectives have broad, long-lasting, cross-cutting, or catalytic impacts on the field?
- **Research innovation:** Is the proposed research original and innovative? Does the proposed research challenge existing research approaches and ideas? Does the project develop or employ novel concepts, approaches, tools, or technologies?
- **Research approach:** Is the overall strategy well-reasoned and appropriate to accomplishing the project goals? Are the resource requirements and proposed timelines reasonable? Are project risks recognized and addressed?
- **Applicant qualification:** Does the applicant have the necessary education and training to carry out the project? Does the applicant have relevant research experience? Has the applicant demonstrated the ability to lead and complete projects?

https://www.hsfoundation.org/programs/science/51-pegasi-b-fellowship/

Note: Text on this slide is verbatim from the 2024 51 Pegasi b rubric

Example Rubrics: 51 Pegasi b

Research Proposal Guidelines

The proposal narrative should:

- ❏ Describe the overall goals and objectives of your research project. What specific problems or questions are you addressing? Why are they important?
- ❏ Discuss how the research compares to, contrasts with, or complements other current activity in the field. What distinguishes your approach?
- ❏ Give a general outline of the anticipated activities, timelines, and key milestones.
- ❏ Describe any project risks and risk mitigation strategies.
- ❏ Describe the short-term research outcomes during the fellowship term, as well as the long-term outcomes beyond the fellowship term. How will your work impact the field and influence your future research directions?

https://www.hsfoundation.org/programs/science/51-pegasi-b-fellowship/

See it in action: Read examples

The best way to understand what makes a strong research proposal is to **read as many examples as you can**.

- Strong ones, of course – but you can learn almost just as much from reading not-so-strong proposals and contrasting them!

See it in action: Read examples

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- Strong ones, of course – but you can learn almost just as much from reading not-so-strong proposals and contrasting them!

The **NASA Hubble Fellowship Program (NHFP) Anti-Racism Initiative** created a resource in response to the #StrikeforBlackLives and #ShutdownSTEM movements

- Houses dozens of NFHP applications, voluntarily shared by Hubble Fellows
- Website taken down in ~Jan/Feb 2025, but database now hosted on the AMP-UP website as of July 1 2025! https://amp-up.space/mentorship.html

See it in action: Read examples

Ask current/past postdocs (fellows, or successful applicants of whatever opportunities you're applying to) **if they'd be comfortable sharing** their submitted research proposal / application materials with you. (This is a common request!)

- ❏ Could be as simple as sharing PDFs in an email; could also ask to meet and talk in more detail
- ❏ Of course, respect their answer – sometimes application materials can be quite personal

Email templates from Taylor Hutchison:
https://docs.google.com/document/d/1mTvtpCQHsra6GORZCuwWOZ70Ddh6B-CFOtoMVbHZLLU/edit?usp=sharing

Put it in action: Your Research Proposal

Make sure your research proposal is **tailored to each specific position** and/or **associated rubric!**

- ❏ If the rubric/job advertisement asks you to touch on particular points in the proposal, make sure to include these
- ❏ Keep an eye out for keywords in the rubric, and make sure to include or address these in your proposal
- ❏ Make sure the research you're proposing is a good fit for the institution/research group/supervisor

When Evaluating [Your] Research Proposal(s)

When reading a research proposal that has been shared with you, or when evaluating your own draft, ask yourself:

- ❑ Is it immediately clear what this proposal is about?
- ❑ Is the “big picture” interesting and significant (broadly to astronomy)?
- ❑ Is there some risk involved with the proposal? In an exciting way, or a worrying way? In what way does the proposal perform risk mitigation?
- ❑ Can the proposed goals be reached in ~3 years?
- ❑ Does it seem like the applicant can accomplish the goals laid out?


Figures in a Research Proposal

Figures/Visuals in a Research Proposal

- ❏ Think about *proposal-style* figures
- ❏ Annotate figures from your talks or papers
- ❏ Include a descriptive caption that summarizes the punchline
- ❏ Consider the following two figure “types”...

Figures/Visuals in a Research Proposal

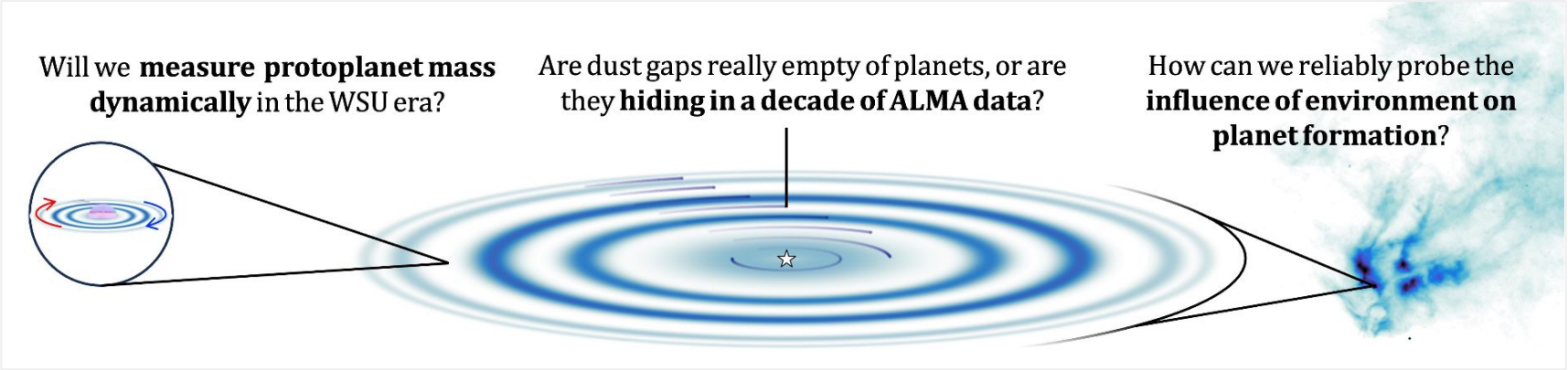
1. The “Beautiful Butterfly” Figure

- ❏ A pretty picture / eye candy
- ❏ Captures your reader’s attention
- ❏ Could be a schematic that visually conveys the fundamental concepts behind your proposed projects

Figure types taken from:
“Marketing for Scientists”
by Marc J. Kuchner (NASA)

Figures/Visuals in a Research Proposal

1. The “Beautiful Butterfly” Figure – example



Example by Jess Speedie

Figures/Visuals in a Research Proposal

2. The “Jenny Craig” Figure

- A “before and after” photo: A direct comparison between what the state of field or problem is **now**, vs. what it will be **if you are given the job/funding**
- It effectively says, “This is what you have now, and this is what you’ll get if you buy my product” (i.e., hire me)
- Sell the blender with a picture of a margarita (i.e., the future)

Figure types taken from:
“Marketing for Scientists”
by Marc J. Kuchner (NASA)

Figures/Visuals in a Research Proposal

2. The “Jenny Craig” Figure – example

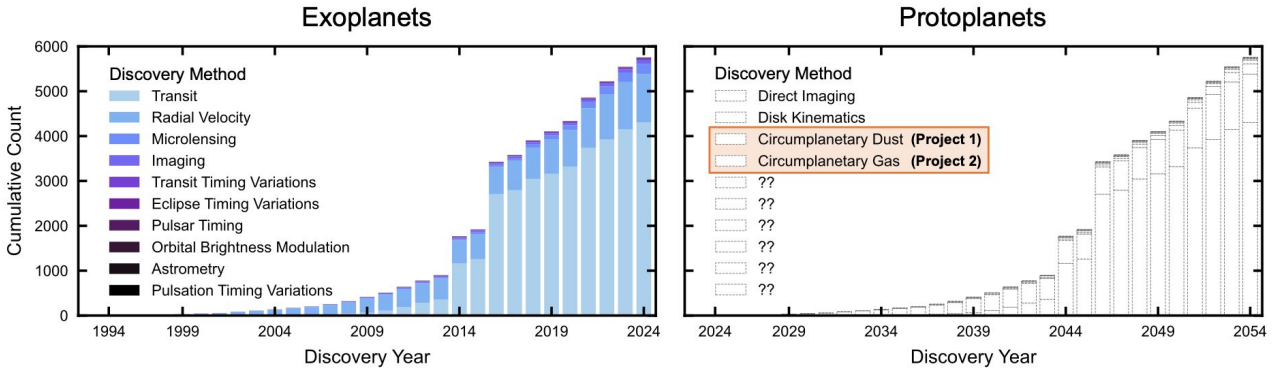


Fig. 4: **(Left)** The last 30 years of exoplanet discoveries, retrieved from the NASA Exoplanet Archive (Akeson et al. 2013). **(Right)** My vision for the next 30 years of protoplanet discoveries, motivating my proposed research. The methods that I will advance or newly establish are highlighted in the legend.

Example by Jess Speedie

Proposed Timelines

Including a timeline shows you've thought through how your proposed research program is accomplishable in the funded time.

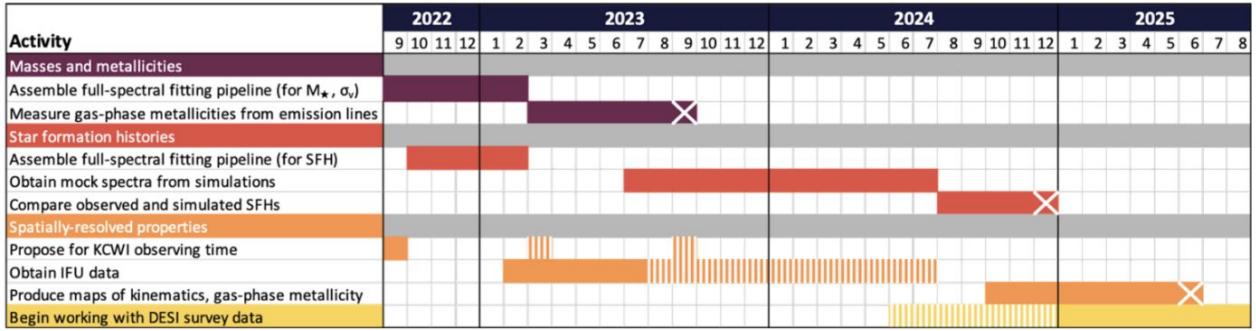


Figure 1. Example timeline from an Astrobiter's successful Hubble Fellowship application. This was made using Excel, but you could probably make something similar using any spreadsheet software.

https://astrobites.org/2022/08/03/guide-to-postdoc-apps-part2/

Proposed Timelines

Including a timeline shows you've thought through how your proposed research program is accomplishable in the funded time.

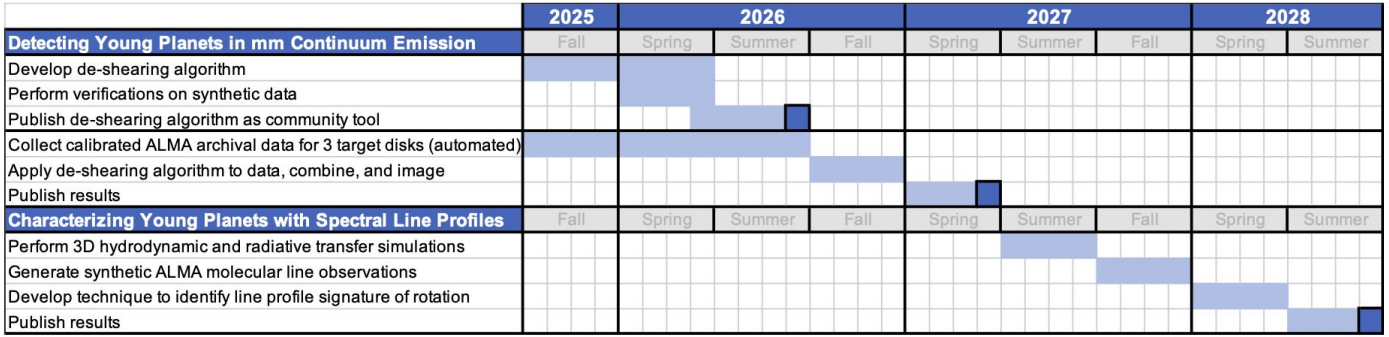


Fig. 8: Timeline over 3-year Fellowship. Dark blue squares indicate publications.

Example by Jess Speedie

GAAP

Session 1 | June 19, 2025

Coffee Break


Project Selection & Development

Selecting & Developing Projects

A compelling research project…

- ❑ Is novel.
- ❑ Is impactful.
- ❑ Is timely.
- ❑ Is viable.
- ❑ Delivers concrete deliverables.

Selecting & Developing Projects

A compelling research project…

- ✅ Is novel.
- ❑ Is impactful.
- ❑ Is timely.
- ❑ Is viable.
- ❑ Delivers concrete deliverables.

- ❑ What kind of superlatives can be used to describe your goals?
- ❑ In what ways are you introducing innovation?
- ❑ Pick a project that excites you (rather than the trendy topic du jour – you want to distinguish yourself)

Selecting & Developing Projects

A compelling research project…

- ✅ Is novel.
- ✅ Is impactful.
- ❑ Is timely.
- ❑ Is viable.
- ❑ Delivers concrete deliverables.

- ❑ Contextualize your projects – how are they relevant to the rest of your subfield?
- ❑ Why should astronomers outside of your subfield care as well?

Selecting & Developing Projects

A compelling research project…

- ✅ Is novel.
- ✅ Is impactful.
- ✅ Is timely.
- ❑ Is viable.
- ❑ Delivers concrete deliverables.

- ❑ Why is *now the time*?
- ❑ Why was this not possible before?
- ❑ Why not wait?
- ❑ Why does this need to be done RIGHT NOW?

Selecting & Developing Projects

A compelling research project…

- ✅ Is novel.
- ✅ Is impactful.
- ✅ Is timely.
- ✅ Is viable.
- ❑ Delivers concrete deliverables.

- ❑ Should be viable *from an ambitious, optimistic perspective*
- ❑ Balance viability with impact (see next slides)
- ❑ Don't play it too safe, but readers need to believe you can execute your project(s)

Selecting & Developing Projects

A compelling research project…

- ✅ Is novel.
- ✅ Is impactful.
- ✅ Is timely.
- ✅ Is viable.
- ✅ Delivers concrete deliverables.

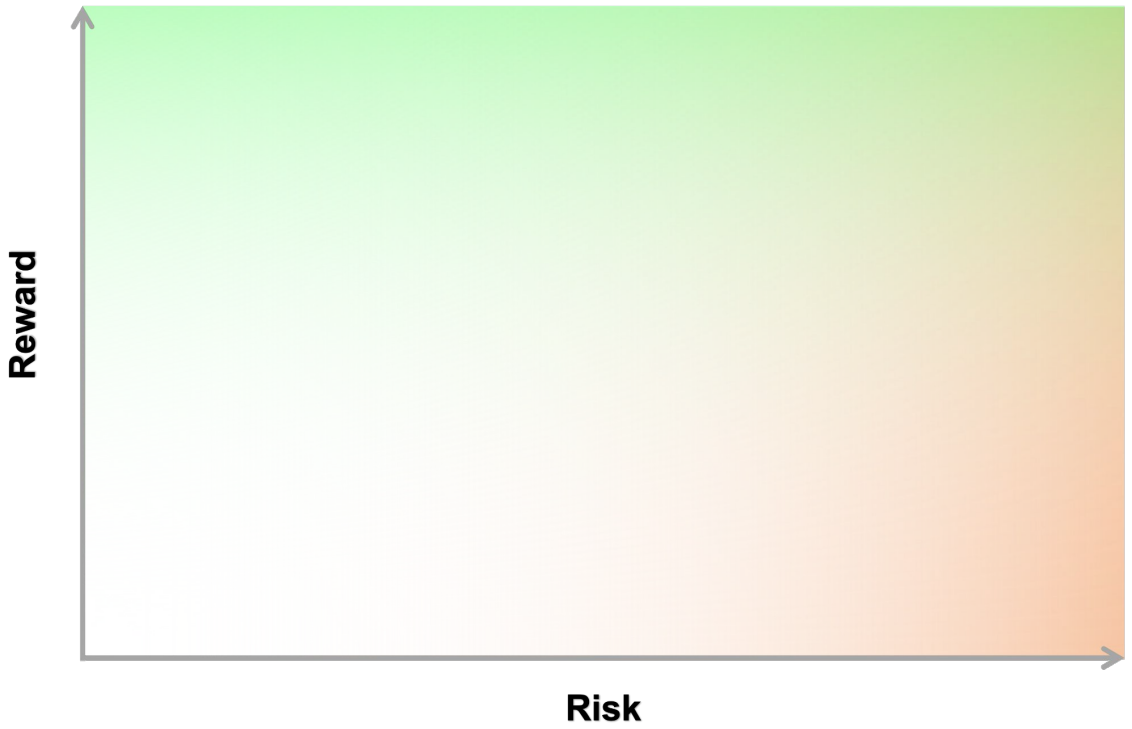
- ❏ "During the course of this fellowship, I will deliver A, B, and C"
- ❏ Examples of deliverables: Paper, legacy dataset, algorithm, code package…
- ❏ Deliverables all contribute to the same broad goal

Risk vs. Reward Space

This is a key parameter space to understand when crafting a fellowship research proposal (but not often known to or considered by applicants).

- ❏ In what region of risk vs. reward space does [prize fellowship X] live?
- ❏ Design your proposed research projects to live in the appropriate region

Risk vs. Reward Space



JS thanks Ryan Loomis (NRAO) for this representation of “Risk vs. Reward Space”

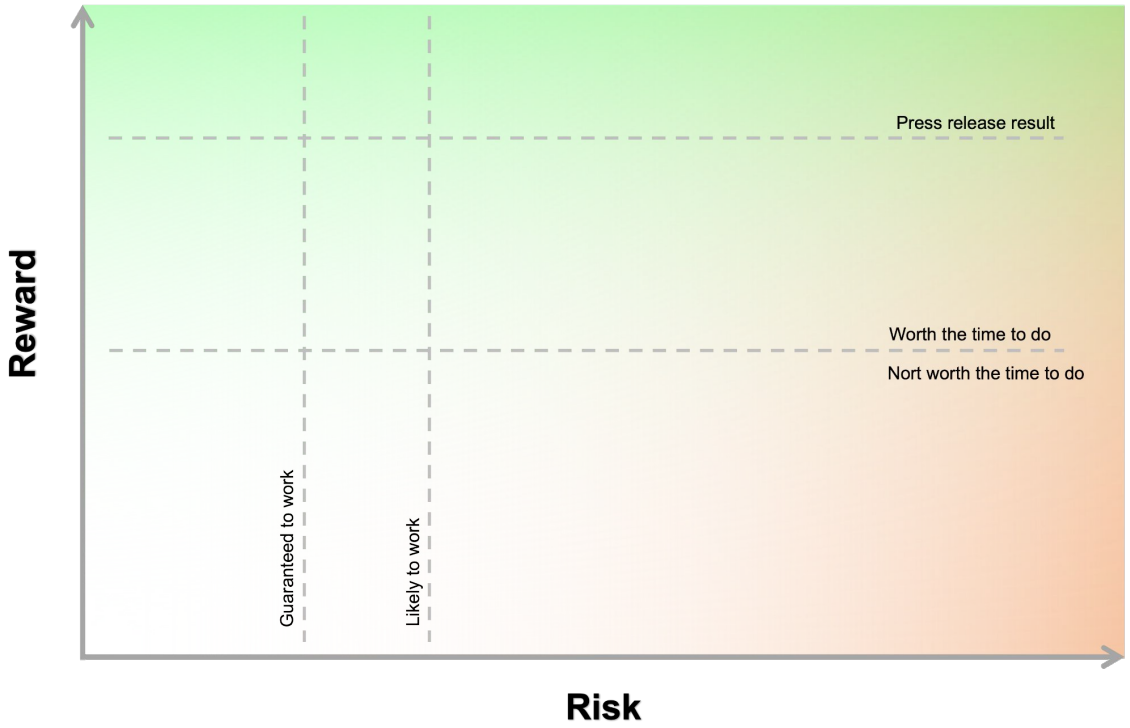
Risk vs. Reward Space

High Reward = Awesome discovery / press release result. The fellowship gets to put their name next to yours.

High Risk = Proposed research is unlikely to be successful, or, it could be successful but not in the funded timeframe.

JS thanks Ryan Loomis (NRAO) for this representation of “Risk vs. Reward Space”

Risk vs. Reward Space



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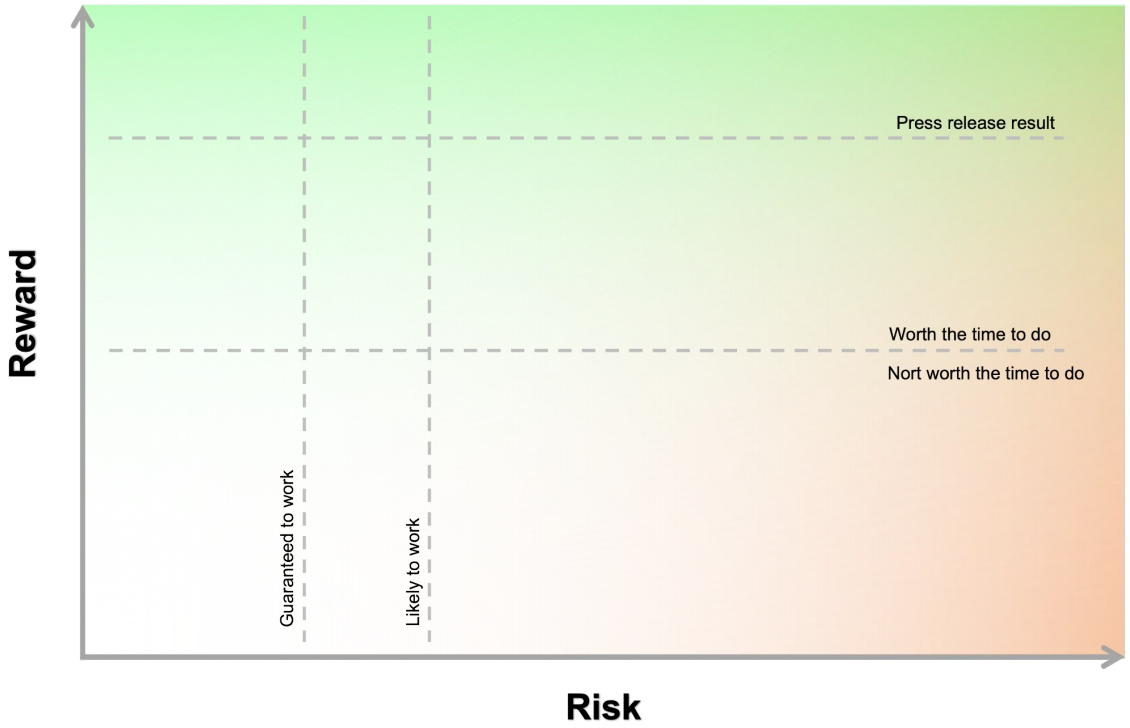
Risk vs. Reward Space



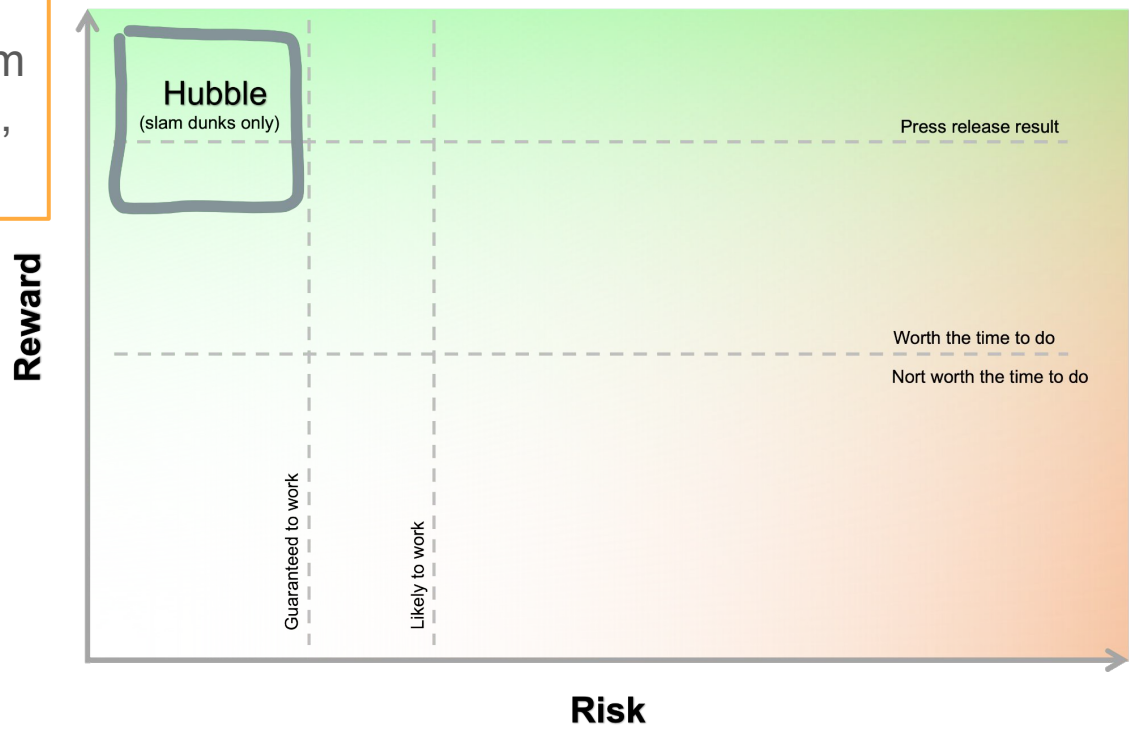
Obviously you want all your projects to be above this line

So the axis you're really playing with is the risk-axis

JS thanks Ryan Loomis (NRAO) for this representation of "Risk vs. Reward Space"

Risk vs. Reward Space

NHFP is in the business of slam dunks. Low risk, high reward.



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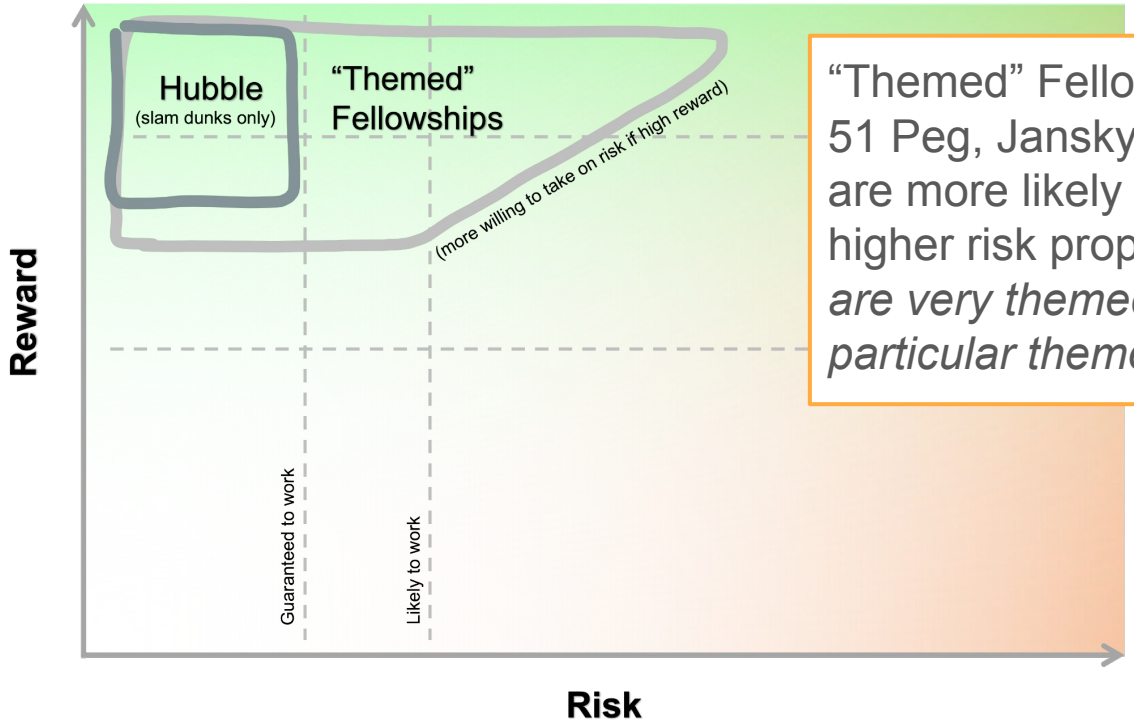
Risk vs. Reward Space



"Themed" Fellowships (e.g. 51 Peg, Jansky, Brinson) are more likely to accept higher risk proposals, *if they are very themed for what the particular theme is*.

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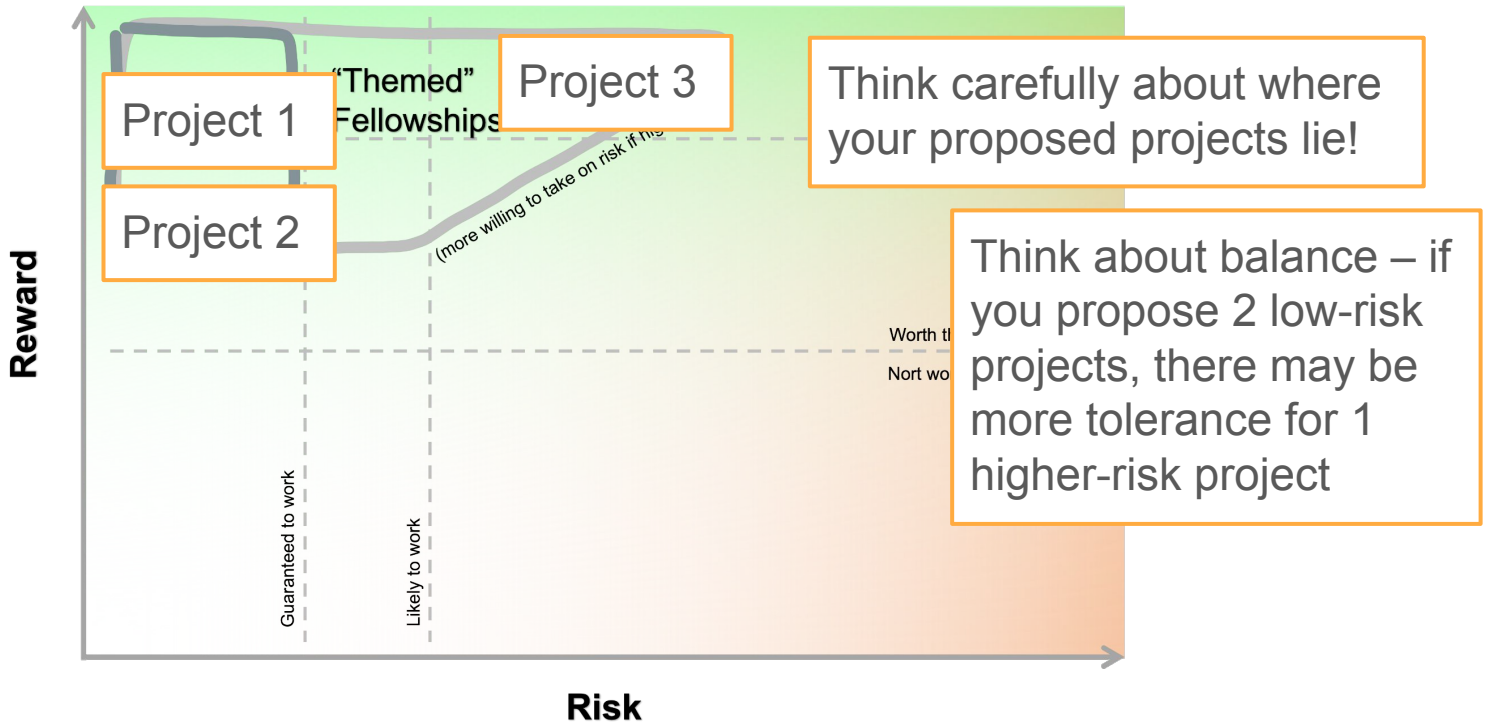
Risk vs. Reward Space



Think carefully about where your proposed projects lie!

Think about balance – if you propose 2 low-risk projects, there may be more tolerance for 1 higher-risk project

JS thanks Ryan Loomis (NRAO) for this representation of "Risk vs. Reward Space"

Attributes constituting “low” risk

- What you’re proposing is something you’ve done before
  - E.g., The pipeline needed for the proposed research is one you have already developed and published
- The data is already in hand
  - You don’t need to propose / rely on observing uncertainties
- You will be in an environment (will have people around you) who will support you and your work
  - The host advisor/local research group/department has the exact appropriate resources, expertise, experience
- Eliminate negatives more than dazzling people


How & When to Start Writing

#1 Key Ingredient in a Research Proposal

Every research proposal needs
a **research question**(s).

The research question(s) drive(s) the proposal.

#1 Key Ingredient in a Research Proposal

State a research question, and match it with a single research tool* that will answer the question.

* Tool could mean: approach, methodology, dataset, algorithm, code…

#1 Key Ingredient in a Research Proposal

State a research question, and match it with a single research tool* that will answer the question.

NB: Not *address* the question, not *make progress toward* answering the question, but ***answer*** it.

Brainstorming Research Questions

If you had 3 ~~wishes~~ *answers* from a magic all-knowing genie to any questions you want, what would those questions be?

If you could ask anything, what would you want to know?

Brainstorming Research Questions

- Identify the big, open questions in your field
- Consider linking your work and your goals to major astronomy goals
- Astro2020 Decadal Survey or Long Range Plan 2020 can be useful resources for seeing what others care about
  - Astro2020 Decadal: https://www.nationalacademies.org/our-work/decadal-survey-on-astronomy-and-astrophysics-2020-astro2020
  - LRP 2020: https://casca.ca/?page_id=11499

Exercise: MadLibs

__(broad, obviously important topic)__ is super important. Recent progress includes __(literature reference)__ and __(literature reference)__. However, other people's work falls short of __(lofty goal)__ because __(limitation)__. This means __(why this is really bad)__.

My research will overcome this by __(heroic solution)__. I am applying to __(fellowship name)__ to support a research program that will deliver __(concrete deliverables)__.

Putting Pen to Paper

Start the first draft as a **sequence of responses** to the prompts in the selection rubrics. The *final* draft should address all of these prompts, so why not use them as the building blocks?

In the process of doing this for each project, you may find it's an easier exercise for some projects than others. This tells you which projects are strong and which are weaker!

Putting Pen to Paper

Note: Prompts on this slide are from the 2024 51 Pegasi b rubric, plus some supplements

Start the first draft as a **sequence of responses** to the prompts in the selection rubrics. The *final* draft should address all of these prompts, so why not use them as the building blocks?

1. Describe the problem. *What is the important problem or critical barrier addressed? Why is this specific problem important?*

[Type your response for Project A, then repeat for Project B, Project C, etc…]

Note: Prompts on this slide are from the 2024 51 Pegasi b rubric, plus some supplements

Putting Pen to Paper

Start the first draft as a **sequence of responses** to the prompts in the selection rubrics. The *final* draft should address all of these prompts, so why not use them as the building blocks?

2. Describe the solution (the project). *Describe the overall goal and objective. What superlatives describe the goal? What are the deliverables? Give a general outline of the anticipated activities, timelines, and key milestones.*

[Type your response for Project A, then repeat for Project B, Project C, etc…]

Note: Prompts on this slide are from the 2024 51 Pegasi b rubric, plus some supplements

Putting Pen to Paper

Start the first draft as a **sequence of responses** to the prompts in the selection rubrics. The *final* draft should address all of these prompts, so why not use them as the building blocks?

3. Describe the approach. *What novel concepts, tools, approaches or technologies are developed or employed? Discuss how the research compares to or contrasts with or complements other current activity in the field. What distinguishes your approach? Why was it not possible before?*

[Type your response for Project A, then repeat for Project B, Project C, etc…]

Putting Pen to Paper

Note: Prompts on this slide are from the 2024 51 Pegasi b rubric, plus some supplements

Start the first draft as a **sequence of responses** to the prompts in the selection rubrics. The *final* draft should address all of these prompts, so why not use them as the building blocks?

4. Describe the innovation. *In what way is this original and innovative? What existing research approaches or ideas are challenged? Why is yours the optimal approach for reaching the targeted goals?*

[Type your response for Project A, then repeat for Project B, Project C, etc…]

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Putting Pen to Paper

Start the first draft as a **sequence of responses** to the prompts in the selection rubrics. The *final* draft should address all of these prompts, so why not use them as the building blocks?

5. Describe the (low) risk. *How is the strategy well-reasoned and appropriate? Are the resource requirements and proposed timelines reasonable? What are the project risks and are they recognized and addressed? Address "Potential Weaknesses to Shore Up". Why you? How do we know you will deliver?*

[Type your response for Project A, then repeat for Project B, Project C, etc…]

Note: Prompts on this slide are from the 2024 51 Pegasi b rubric, plus some supplements

Putting Pen to Paper

Start the first draft as a **sequence of responses** to the prompts in the selection rubrics. The *final* draft should address all of these prompts, so why not use them as the building blocks?

6. Describe the impacts. *If objectives are met, what are the broad, long-lasting, cross-cutting or catalytic impacts to the field? Why now? Why should people outside the subfield care? What are the long-term outcomes (beyond the fellowship term)? Why is this a "must be done"?*

[Type your response for Project A, then repeat for Project B, Project C, etc…]

Final Miscellaneous Tips

- **Lean on your support network.** Ask people to share their applications with you. Build up a bank of previous applications to learn the language.
- Learn how to **start each paragraph with the main message** of that paragraph. The rest of the sentences in that paragraph just back up the first sentence.

Final Miscellaneous Tips

- **Start early.** Start brainstorming research questions now, and have conversations about them with your mentors.
- Get feedback and advice on your ideas from a **wide variety** of people.
- If you are N>1 years away from entering the job market, consider making a note/list of research questions you think of or come across now


Some Big-Picture Philosophy

Adopt the Symmetric Perspective

Before you do anything (write a postdoc application, or write a paper, or make a talk), think about what are the concerns, needs, or desires of **the other side**.

In other words: **Know your audience.**

Adopt the Symmetric Perspective

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In other words: **Know your audience.**

- ❏ What are the needs and desires of NASA? ESO? NSF? NAOJ? NRAO? The Brinson Foundation? The Heising-Simons Foundation?
- ❏ What are the needs and desires of the University of [X]? The Department of [Y]? Supervisor [Z]?

What do funders* want?

* Selection/hiring committees for any/all job opportunities you may have in mind

To hire the **next leader** in some area of the field.

Or, the person who looks like they're on their way there.

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Or, the person who looks like they're on their way there.

Fellowship organizations (e.g. NHFP), specifically, want:

To say **they** launched [very successful person]'s career.

What leading means or looks like...

Something you do or provide is uniquely indispensable.

- ❏ Figure out a unique way to be indispensable

You open(ed) a new area of study, or research question.

- ❏ Set up a new category/niche/area you can be first in/impactful in/the leader of/the go-to reference for

You have a “brand” or signature research idea.

- ❏ To own a brand, it helps to invent (own) a word or term

These ideas taken from:
“Marketing for Scientists”
by Marc J. Kuchner (NASA)

“I shouldn’t apply, I’m not a good candidate for [insert prize fellowship here]”

“I shouldn’t apply, I’m not a good candidate for [insert prize fellowship here]”

When you feel this feeling, remind yourself of the following:

- ❏ Successful applicants of [insert prize fellowship here] are often surprised / in disbelief upon receiving their offer
- ❏ In order to go anywhere interesting in life you HAVE to get rejected
- ❏ How often you do/don’t get rejected is a function of how ambitious you are/aren’t


Questions from registrants

Questions from registrants

To enable **unlimited questions at any time** throughout the series, we have a **Question Box** on the website!

Credits & Thanks

- Astronomy Mentorship Program for Upcoming Postdocs (AMP-UP) https://amp-up.space/index.html
- Eric Koch https://e-koch.github.io/
- Jess Speedie https://jspeedie.com/
- Emily Deibert https://emilydeibert.github.io/