Turning your Nuclear Physics Degree into a Career

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$$\begin{split} N_{\text{faculty}}(t) = & N_0 e^{t/\tau} \\ N_{\text{openings}}(t) = & \frac{N_0}{\tau} \left[e^{(t-30)/\tau} + e^{t/\tau} \right] \\ N_{\text{applicants}}(t) = & N_0 \frac{10}{30} e^{t/\tau} \end{split}$$

There are not nearly enough faculty openings and its getting worse.



Advice that everyone needs to hear:

- There are not enough faculty jobs for people who want them.
- There are abundant postdoc opportunities, but taking a postdoc may not be right for everyone.
- Most PhDs leave academia and are happily employed.

Take my advice with a grain of salt.

• My experience is limited to the United States.

 I have experience as an applicant, not as a member of a search committee.

I'm just one person.
 No individual situation is typical.

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- Tenure-track at GW 2020–



Academic physics is a ponzi scheme.



1500 new physics PhDs / year, faculty turnover is < 300/year https://www.aip.org/statistics

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- about where you live, or the kind of institution
- It may take a long time.
 - How would you feel about a 9-year postdoc?

Faculty Applications

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- **a** \approx 3 letters of recommendation
- CV
- Research statement
- Teaching statement

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You might additionally be asked for:

- Service statement
- Diversity statement
- Proposal for a new course

A faculty application is a great opporunity to lay out your "five-year plan."



2016-2017: 3 applications

3 direct rejections

- 2016–2017: 3 applications
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- 2017-2018: 11 applications
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 - 1 shortlist \rightarrow rejection

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Make your postdoc count!

- High-impact results
- Rapid timeline
- Publications in major journals

Fun, exciting, but highly speculative research is a poor strategy.

After you become a faculty member: Where does the money come from?

A university will pay you 9 months out of the year.

- i.e., if your "12-month salary" is k\$120, they will pay k\$90.
- Your responsibility is to teach, serve the university from September through May.

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- All research must be funded by grants.
 - US federal grants will pay up to two months of summer salary.
 - Salaries for postdocs, stipends and tuition for students, travel, equipment
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Universities provide a "start-up" fund for new faculty to give them time to secure grants.

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Postdocs are in demand because they produce significantly more research per dollar.



Landing your dream postdoc: exploit personal connections.

Applying to job postings is not the most effective strategy.

Use SOCIAL SKILLS

- Socialize at conferences!
- Have your mentors, their friends be your marketing agents!
- Write to people whom you'd like to work for!

People hire based on word of mouth.

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During your postdoc time:

- Prioritize high-impact, short-time line results.
- Apply early, apply often.
- Know how long you'd be willing to stay a postdoc.

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Where people go after their PhD

Initial Outcomes 1996, 1997, 2000, and 2001 Physics PhD Recipients.



Includes only degree recipients who remained in the US.

Starting salaries

Starting Salaries for New Physics PhDs, Classes of 2015 & 2016 Combined



My closest friends in grad school are now

- a data scientist at a private research lab
- an engineer at a DoD research and development center
- an analyst at a small consulting firm
- a researcher at a different DoD research and development center
- a software developer at a healthcare company
- a proton-therapy medical physicist
- a machine-learning engineer for a business software company

Where to start?

www.aps.org/careers

APS				American Physical Society Sites APS Journals PhysicsCentral Physics Mapazine			
Publications	Meetings & Events	Programs	Membership	Policy & Advocacy	Careers In Physics	Newsroom	About APS
Homa Careers In Physics Careers In Physics							
Search Physics Jobs					Upcoming Eve	ents & Meeting	S

Advancing Graduate Leadership

AGL Professional Skills Development Workshops December, 2021 - June, 2022

Upcoming Workshops:

Career Paths in Physics: Effective Strategies for Non-Academic Physics Careers

For Employers: Post a Job

Explore Physics Careers

Search Jobs

- Job board
- Advice on how to apply

Advanced Search | Post Your Resume | Job Alerts

Resources for Job Seekers

Webinars, resources

Work on your web presence

- Get a LinkedIn profile and *post*
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 - Research your options
- Talk to people
 - Build your network
 - Ask questions, *learn!*

Skills to think about now

What I hear industry people say about physicists

- They are bad at finishing projects on a timeline.
- They lack management skills.
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- They are bad at finishing projects on a timeline.
- They lack management skills.
- They don't know how to write code that other people will use.

• No matter the problem, they'll find a way to attack it.

To recap:

Not enough faculty jobs



- Not enough faculty jobs
- Take a postdoc for the right reasons



To recap:

- Not enough faculty jobs
- Take a postdoc for the right reasons
- Physicsts succeed in industry





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AIP Statistics

aip.org/statistics

Physicists are extremely employable.

Even in a bad labor market, people want to hire physicists.

Your skills are in serious demand right now.