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WORKSHOP: THE ACADEMIC PATH

Understanding and Planning an Academic Career in Physics/Astrophysics

BIG PICTURE

- Your career should:
  - Align with your values
  - Allow for personal and family goals
  - Rely primarily on your strengths (what you're "good at")
  - Allow (or provide avenues for) personal and professional development
  - Feel rewarding or worthwhile >50% of the time
  - Provide sufficient financial security for your lifestyle

BIG PICTURE

- Why choose a career in academia?

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  - You enjoy:
    - Research
    - Writing/reading highly technical papers
    - Teaching/Mentoring

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  - You enjoy:
    - Research
    - Writing/reading highly technical papers
    - Teaching/Mentoring
  - You really want to:
    - Incrementally increase the knowledge of humankind in a very specific area
    - Independently choose the topics and direction of your work
    - Solve interesting problems

BIG PICTURE

- What are some types of positions in this career path?
  - Tenure track
    - Professor (4-year+ research institution, “PI”)
    - Professor (2-year teaching institution)
  - Non-tenure track
    - Adjunct/Lecturer (don’t do it if you have other options)
    - Lab manager
    - Research staff (uncommon in academia, relatively common in gov’t labs)

BIG PICTURE

- What are some perks of a career in academia?

BIG PICTURE

- What are some perks of a career in academia?
  - Flexible schedule/work location (within limits)
  - Autonomy
  - Unrivaled job security (in 10 years… if all goes well)
  - Travel (may change post-COVID)
  - Collaborate with cool, smart people
  - Support and develop cool, smart students

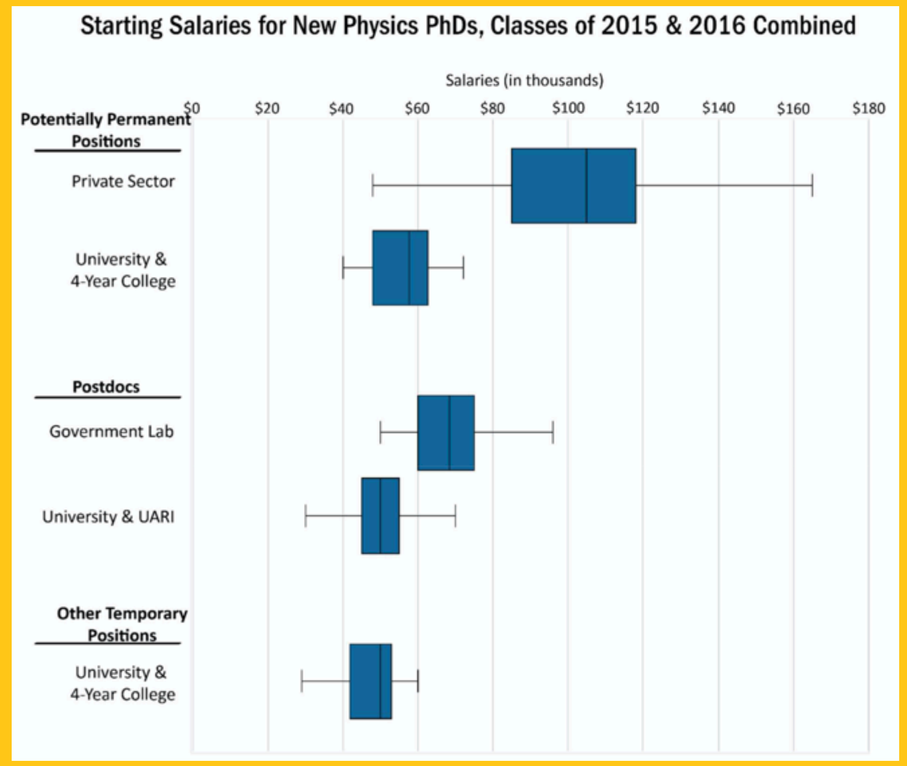
BIG PICTURE

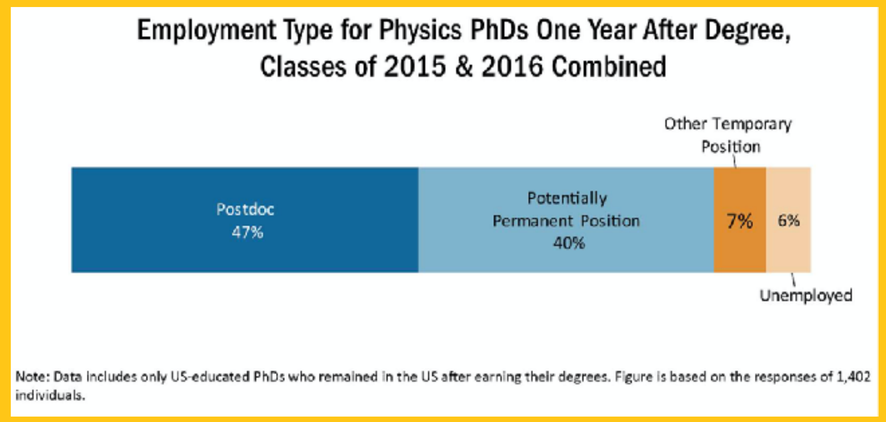
- What are some challenging aspects of a career in academia?

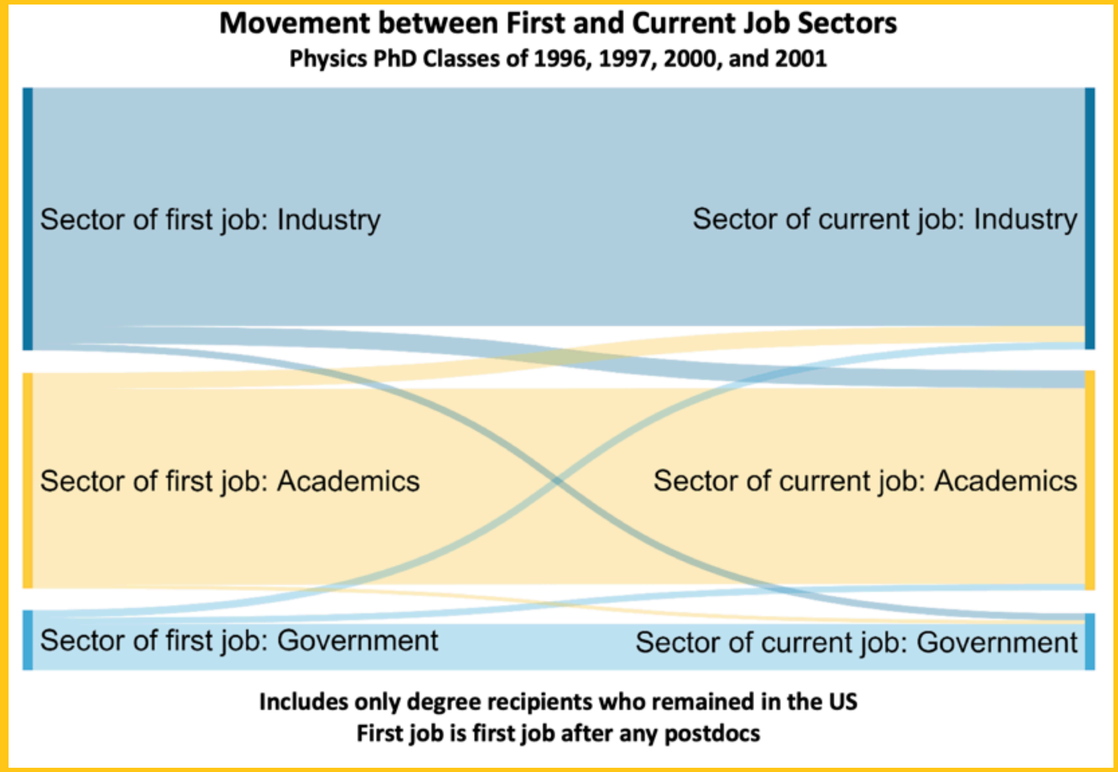
BIG PICTURE

- What are some challenging aspects of a career in academia?
  - Job insecurity
  - Location
  - Dependence on senior people/advisors
  - “Publish or perish”
  - Funding/Income
  - Politics
  - Managing/Collaborating

JOB STATISTICS







- **www.aip.org/statistics/reports/**

5 MINUTES : SELF-REFLECTION

- What are your personal values and priorities? How do they fit in with an academic career?
- What are your reasons for pursuing this path?
  - External (parents, accolades, proving you can do it, etc.)?
  - Internal (passion for research area/teaching, don’t want to choose now so grad school is appealing, etc.)?
- Every career has drawbacks. What are your thoughts on the challenges presented?
- How do you feel about the statistics?

DISCUSSION

QUESTIONS?

CAREER TIMELINE

Undergrad (4-5 years):

- Senior year/gap year/post-bacc:
  - Take GREs and apply to graduate schools/fellowships

Graduate School (5-6 years):

- Year 2:
  - Pass qualifying exams, advance to candidacy (get a Masters en route)
- Dissertation year:
  - Apply for fellowships/post-docs/faculty jobs(?)

Post-Doc (2-5 years):

- Last year(s) of contract/funding (up to 3 times):
  - Apply for fellowships/post-docs/faculty jobs

Junior Faculty (Assistant Professor, 5-7 years):

- Tenure review year:
  - Submit exhaustive portfolio/letters and get promoted to tenure (hopefully)

Senior Faculty (Associate, Full Professor):

- You made it!

TRANSITION TO GRAD SCHOOL

- Physics vs. Astronomy/Astrophysics
  - Physics
    - Generalized physics coursework (quantum, thermo, etc.)
    - Exam/course requirements more stringent/competitive (weed out, etc.)
    - Culture generally less open-minded and less female
    - You can work on any thesis topic, including astro, and ultimately be a professor in many types of departments (physics, astro, applied math, CS, etc.) depending on your expertise
  - Astro
    - Applied physics coursework (very solid foundation helps!)
      - Melds many general topics as they apply to specific areas, like radiative transfer, stars, etc.
    - Exam/course requirements less stringent, more flexible/casual
    - Culture generally more open-minded and more female (relative to physics, NOT other sciences)
    - Limited in thesis topics, limited in career prospects - you will generally only be hired as an astro professor, unless you also took physics graduate coursework

TRANSITION TO GRAD SCHOOL

- International Options - another way forward
  - European model:
    - 2 year Masters, often tuition-free but you are responsible for living expenses
    - 3 year PhD on a specific project advertised as a job, no flexibility on end date, but pay is pretty good
  - US to European model:
    - 4-5 year undergrad in US with an excellent thesis project (think “Masters level”)
    - 3 year PhD in Europe, no more classes!

TRANSITION TO GRAD SCHOOL

- What you need to get in
  - Research, preferably published
  - Letters of recommendation
  - Personal/research statements
  - GRE/PGRE (optional/not required for some programs)

TRANSITION TO GRAD SCHOOL

- Choosing the “Right” Program
  - What do you want to work on?
  - Who do you want to work with?
  - What environment do you prefer working in?
  - Do you prefer a competitive/collaborative culture?
  - What non-academic factors (lifestyle/family/community) are crucial/preferable?
  - How important is “academic pedigree” to you?

5 MINUTES : SELF-REFLECTION

- How would you answer these questions today?
  - What do you want to work on?
  - Who do you want to work with?
  - What environment do you prefer working in?
  - Do you prefer a competitive/collaborative culture?
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DISCUSSION

TRANSITION TO GRAD SCHOOL

- Finding the “Right” Program
  - People you know
    - Grad students at other institutions
    - Advice from current professors/research advisors
    - REU sites/research advisors
    - Colloquium speakers
    - Anyone you met at CUWiP or other conferences
  - Department websites of programs of interest
  - gradschoolshopper.com

THOUGHTS ON THE GAP YEAR

- What impact does a gap year have on grad school prospects?
  - Taking a year off:
    - Probably good for you (reduces chance of burning out)
    - Get some “real world” experiences - maybe other careers appeal to you
    - Learn more about yourself outside the academic context
    - Some programs view it negatively, but not all (varies widely)
  - Taking a year “on”:
    - A bridge program or post-bacc research position is viewed favorably by nearly all
    - Intellectually demanding - these are NOT a break!
    - Immersion in a research environment for an extended period is FAR more informative about this career path than undergrad

FINANCIAL OUTLOOK

- TA-ship
  - Generally fall/spring, can be tough to get summer appt.
  - University-funded
- GSR (RA-ship)
  - All-year, or summer only
  - Advisor-funded
- Fellowship
  - Single or multi-year
  - University-funded
- National Fellowship
  - Guarantees most or all of grad school funded!
  - NSF Graduate Research Fellowship Program
  - DOE Computational Science Graduate Fellowship
  - Hertz Fellowship
  - DoD NDSEG

SURVIVING GRAD SCHOOL

- What do I wish I had known?
  - During prospective visits, listen to your gut! (If something feels off, it probably is…)
  - Your grad school experience is shaped MUCH more by your advisor than by the program itself.
    - Don’t rely on your advisor as your only source of support. Seek out and develop relationships with other faculty, too.
  - Not all project ideas are good! MAKE SURE your Masters project is very well-defined! If it’s not, or you figure out that it’s not, ask for something else immediately!
  - Most students think about quitting near the end of year two.
  - Speak up! If you don’t understand something, don’t pretend you do. Your ego will recover, your research might not if you are flying blind.
  - You are not trapped. It’s YOUR PhD, choose your own adventure. You can switch research topics, advisors, programs, schools, and still have a successful career.
  - Make the effort to learn project/time management. Find tools to help you do this.
  - Take notes/biblio on ALL your lit review from Day 1. You will forget/not understand a lot, especially in the beginning, and this will help you master your research area.
  - Take time for other things. You are not defined by your work alone - it’s healthy to develop other areas of your life, too.

TRANSITION TO GRAD SCHOOL

- Choosing the “Right” Advisor
  - Do you want a supervisor/collaborator/something in-between?
  - Are you self-motivated, or do you perform better with someone to push you?
  - What working pace/stress level are you most productive with?
  - Do you prefer an all-business type relationship or a more warm, friendly one?
  - Do you want a lot of one-on-one time? Are you comfortable just checking in occasionally? Once a week? Once a month?
  - What size of group do you want to work in? Do you care how many grad students your advisor has?
  - Does age matter? Acclaim? Other factors?

TRANSITION TO GRAD SCHOOL

- Finding the “Right” Advisor
  - Get to know them one-on-one, meet a few times
  - Speak to their current students
  - Read their Twitter feed
  - Speak to faculty you know that might know them, or their reputation
  - Look at outcomes for their former students
  - Watch lectures/interviews of them on YouTube/seek out any press they’ve done
  - Identify their research area through their website or lit review

5 MINUTES : BREAKOUT ROOMS

- Come up with a list of questions to ask a potential advisor.
  - How do you assess their working style (hands-off/micromanaging/etc.)?
  - How do you assess how much time they'll have for you?
  - How do you assess what their priorities are (teaching/research/mentoring/etc.)?
  - Etc.

DISCUSSION

QUESTIONS?

GOOD LUCK!

www.aip.org/career-resources