

Navigating the academic job market:
Perspectives from an early career scientist

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DPF-Pheno-2024

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My journey in academia!

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Structuring today's discussion:

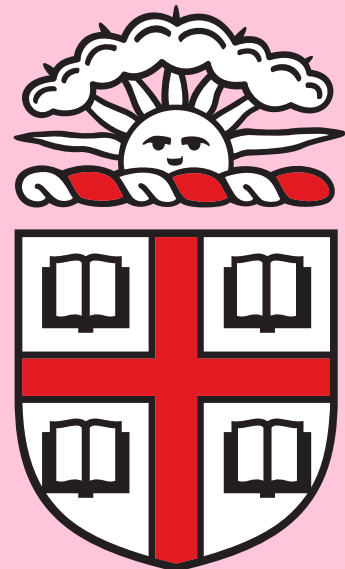
- Let's discuss as I go over the slides (they are just a guide)
- I may be missing key issues
- Perspectives from both applicants and people who have served on hiring committees are very welcome

Who am I?

A collider physicist through and through...



Ph.D. in Physics from
Brown



2007-2015
(conferred 2016)

Post-doctoral Fellow at
Northwestern



2015-2023

Pathway-to-Faculty
Fellow at Wayne State



2023-2024

Starting as
Assistant Professor at
Southern Methodist
(SMU) in fall



2024

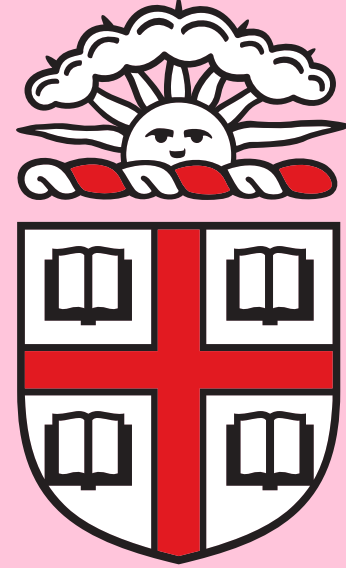
I am also a Humboldt Fellow at DESY!

Who am I?

A collider physicist through and through...



Ph.D. in Physics from Brown



Post-doctoral Fellow at Northwestern



Humboldt Fellow DESY



Alexander von HUMBOLDT STIFTUNG

Pathway-to-Faculty Fellow at Wayne State



WAYNE STATE UNIVERSITY

Starting as Assistant Professor at Southern Methodist (SMU) in fall



2007-2015
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2015-2023

2022-2025

2023-2024

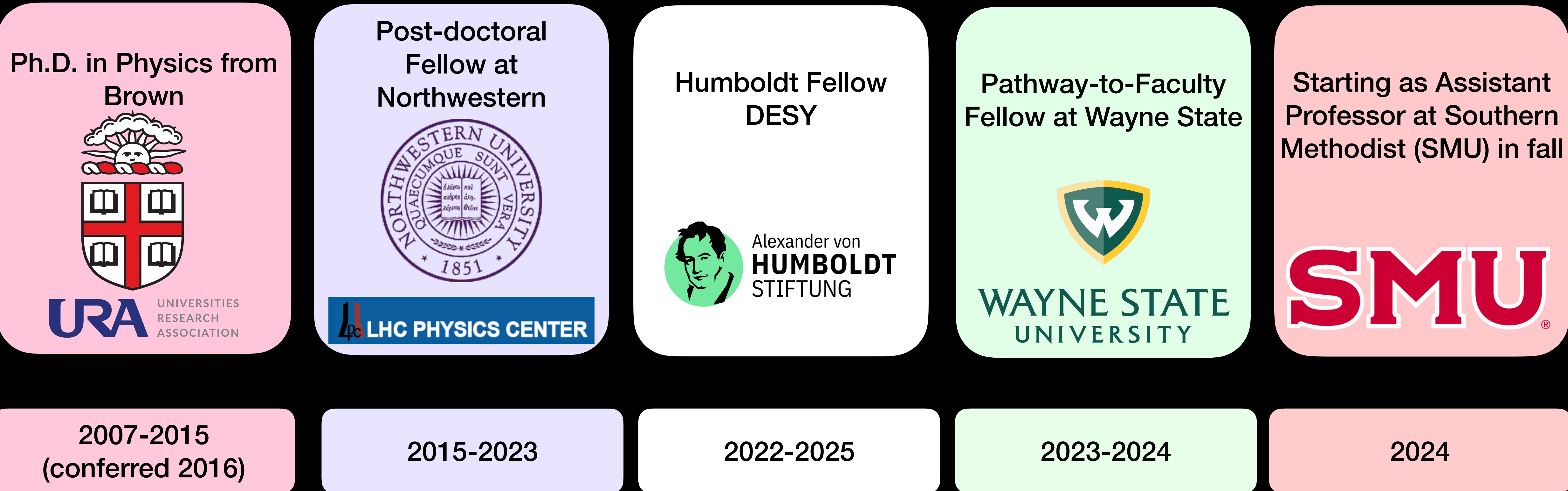
2024

Received support from the URA (2010-2011)

I received support from Fermilab as an LHC Physics Center Distinguished Researcher (2019-2020)

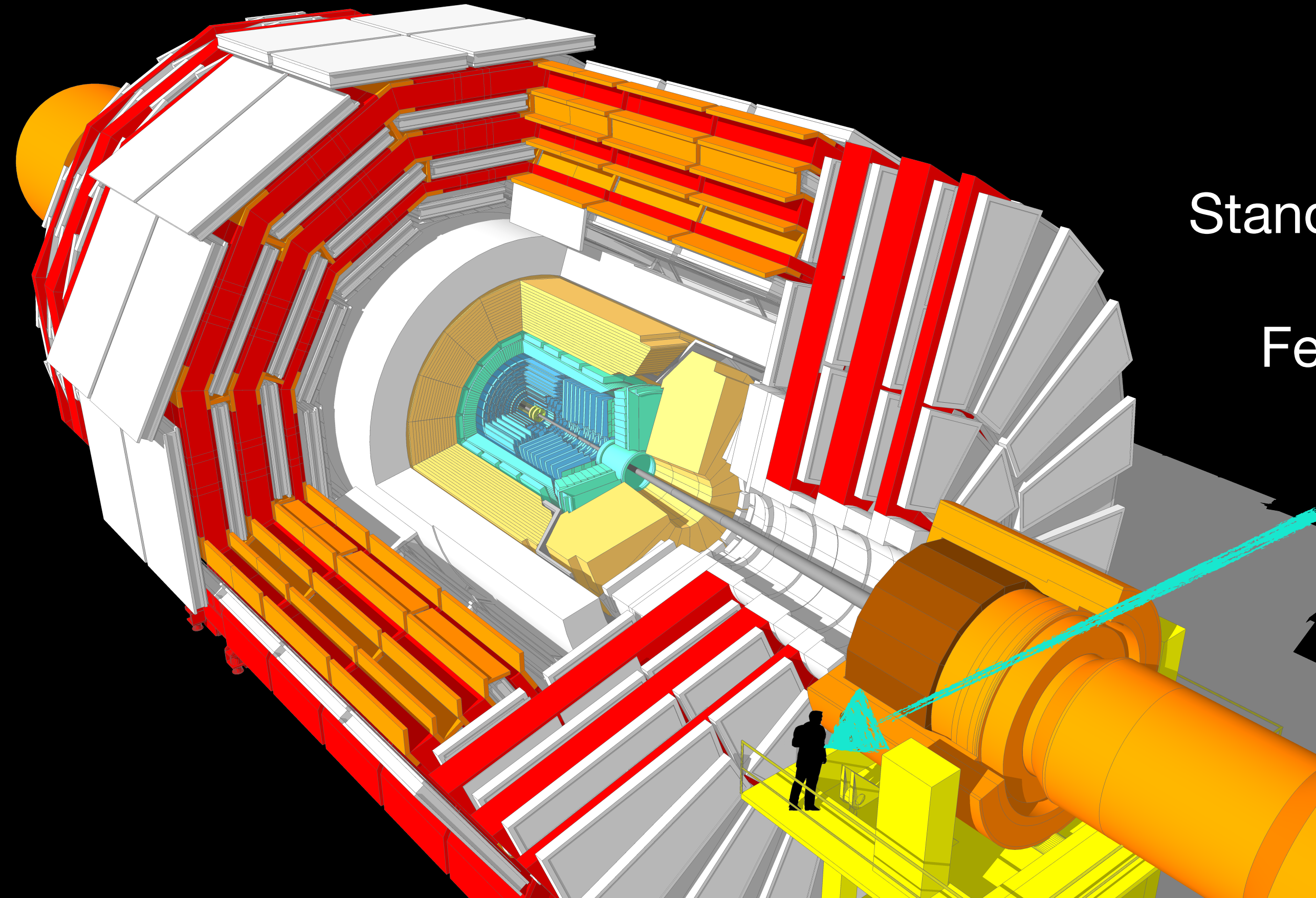
Who am I?

A collider physicist through and through...



Supported through Department of Energy grants received by PI at Brown and Northwestern

I am part of the Compact Muon Solenoid (CMS) Collaboration



Standing out in a large collaboration is hard!

Felt like the little human in this picture!

“CMS has over 4000 particle physicists, engineers, computer scientists, technicians and students from around 240 institutes and universities from more than 50 countries” — from the CERN website

Point of view...

- I am an experimentalist
- I am a collider physicist
- I have been recently on the job market
- I just accepted a faculty position
- I have never been on the other side of the hiring process
 - However, I have spoken to some my senior colleagues who are hiring to get their perspective
- Biased toward US based positions

Today's talk is about the transition from postdoctoral position to a faculty position. The landscape of graduate student → postdoctoral fellow is a lot more varied for experimentalists.

Post-doc to faculty

Postdoctoral position

- Usually classified as a temporary (even trainee) position
- Duration can vary quite dramatically for theorists vs. experimentalists
 - 3-5+ years
- Various types of appointments possible: university, labs and joint appointments
- Focus on research
- Could involve mentoring graduate students in the group
- Application for external funding: not that common in HEP
 - Support can come from various sources like the Universities Research Association and National Labs



Faculty position

- Assistant professor at a university or an equivalent position in a national lab.
- Typically associated with startup funds at a university
- Expected to apply for funding as soon as possible to sustain the newly formed research group
- Independence in research goals
- New: Teaching and service work in university positions



Pheno has a long standing tradition of excellent early career panels

- Pheno 2023: Talk given by Kelly Stifter
- Pheno 2022: Talks given by Keith Dienes and Robert McGehee
- Pheno 2021 (YouTube): Talks given by Julia Gonski and Sara Simon
- Pheno 2020 (YouTube): Talk given by Midhat Farooq
- Pheno 2019: Talk given by Sekhar Chivukula
- Pheno 2018: Talks given by Keith Dienes and Sara Dawson
- Pheno 2017: Talk by Elizabeth Simmons

Outline

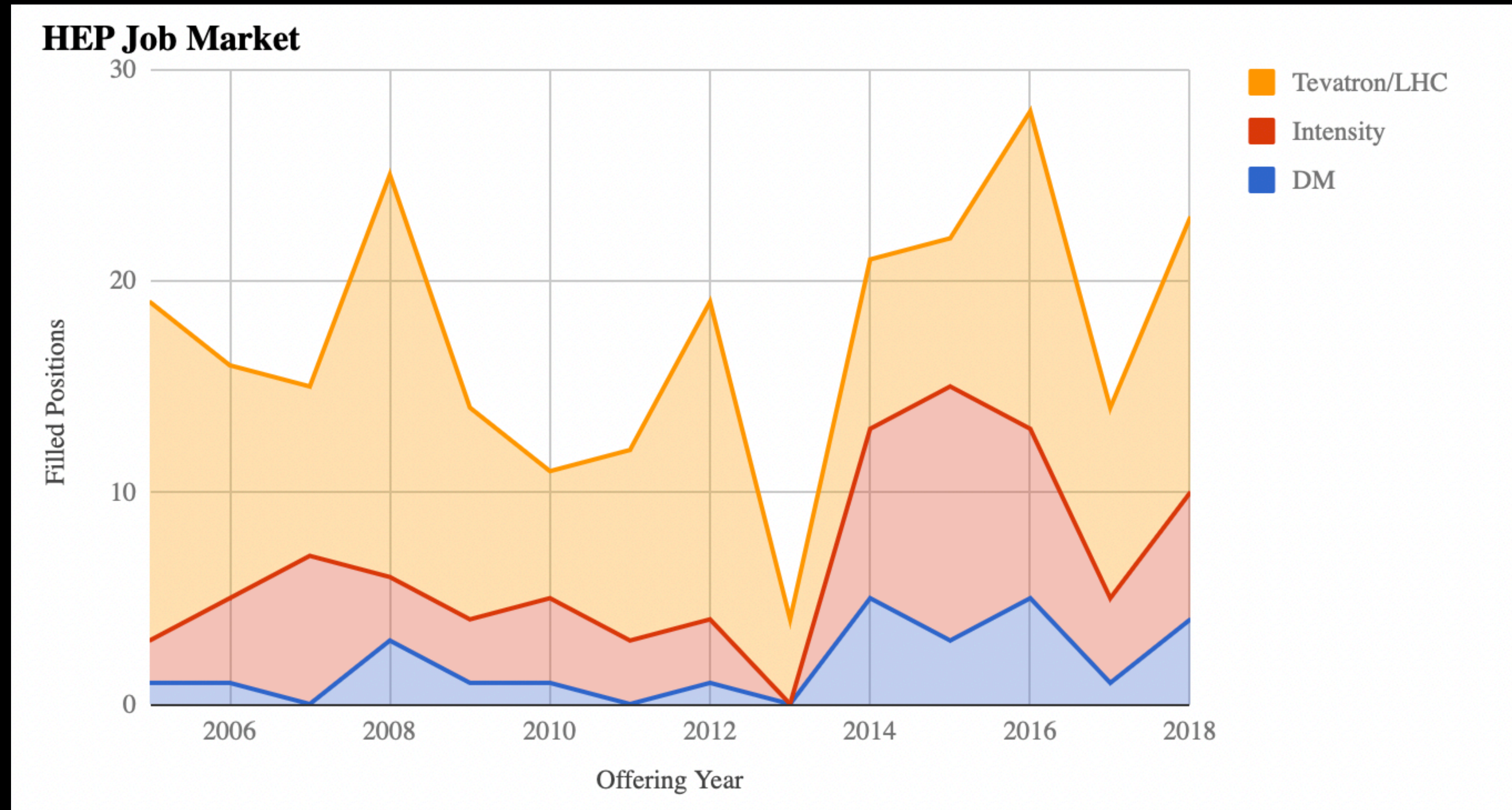
- * Academic job market
 - * How many positions?
- * Timelines
- * What's a typical application package
- * Long and short list process
- * Getting an offer
 - * Choosing when you receive multiple offers and partner accommodations
- * Start-up negotiations
- * Applying for funding

How many positions and what kind of positions?

- Typically 15-20 positions per year including the prestigious fellowship positions (not exhaustive):
 - Wilson Fellowship (tenure track equivalent)
 - Panofsky Fellowship (tenure track equivalent)
 - CERN Limited Duration (LD) Fellowship
- Positions often classified as CDNO (rumor mill lingo):
 - C: Collider (energy frontier)
 - D: Dark Matter (reference to mostly direct detection dark matter experiments, cosmic frontier)
 - N: Neutrino (intensity frontier)
 - O: Other (smaller multifaceted experiments, accelerator-based Dark Sectors searches as an example)

Job trends

- What is striking is the year-by-year variation in the number of positions
- Collider trends may be different from 2018 onward
- Take-away: the job market has its idiosyncrasies!



From the rumor mill

Broad classification: Universities vs. National Labs

- University positions: teaching and service work, funding crucial to sustain research program, tenure structure, amazing opportunity to work with talented students and post-docs
 - Collaboration with national labs
- National labs: mostly research, no teaching, tenure process exists and depends on the exact lab, limited interaction with students through SULI or other programs, lab post docs
 - Collaboration with universities: often university personnel spend time at national labs (both students and post doc)

Timeline for applications

- The timeline is similar to graduate school applications
- Formal advertisements are out between summer or early fall
- Using current cycle (about to close) as an example

Call usually out between summer and early fall 2023

- Deadlines for applications are in fall, rarely early January
- Some deadlines can be tight (month or so to send application)

Interviews, both long and short list start in late fall of 2023 and extend to spring 2024

Offers made in spring or late spring (February-April) of 2024

Cycle usually closes by summer (May/June) of 2024

- 6 month process: not much time between two job cycles

Where do I find the job advertisements?

- I have used (not exhaustive):
 - Inspire hep jobs: <https://inspirehep.net/jobs?sort=mostrecent&size=25&page=1&status=open>
 - Academic jobs online: <https://academicjobsonline.org/ajo/jobs>
 - Physics Today: <https://jobs.physicstoday.org/>
 - Experiment specific listservs

For the candidate: having a web presence is important!

Typical job application package - I

- Cover letter: the importance of the cover letter can vary based on the position
 - It is a great way to introduce oneself and go over a highlights reel of one's career and the future plans (typically one page)
- Curriculum Vitae: formats can vary but in addition to information educational qualifications, list of awards and leadership roles crucial
 - Publication list (with citations) can be part of the C.V. or a separate document based on the exact specifications
 - For large collaborations: it is normal to list only papers where there was direct involvement
 - May not hurt to write the salient features of a paper (sometimes hard to distinguish exactly why a paper is important: new search/measurement with super cool method never used before and enhances sensitivity by several orders of magnitude!)

Typical job application package - II

- Research statement: considered often the most important part of the application statement
 - Length may be pre-specified (3-5 pages)
 - Discussion of past work vs. future work is highly dependent on exact job
 - Typically too much emphasis on past work is not recommended
 - Similarly for how general or specific (find out who will be reading your statement)
 - Focus on specifics of the department and how one's research will be carried out in the future
 - Will most likely be viewed as a vehicle for assessing potential for success with grant proposals

Many thanks to senior members
of the field for sharing their vision!

Typical job application package - III

- Teaching statement: This is broadly a mentoring statement
 - Important to do some outreach work as a post-doc
 - For example, I won the inaugural Sievert Prize at Northwestern and gave a series of eight public lectures on particle physics
 - I taught a course on the Higgs boson at Brown (2015-2016, 2023)
 - Teaching at CMS Data Analysis School counts too!
- Diversity statement: sometimes part of the application package and refers to plans for diversity, equity and inclusivity driven mentoring as a faculty member
 - Past experience should be highlighted
 - In some cases, the teaching and the diversity statement may be required to be merged into one document (2-3 pages)
- **Cannot stress enough: schedule zoom appointments with contact persons specified in the advertisement is very important to tailor applications (it is a lot of work, but worth it!)**

Typical job application package - IV

- Letters of recommendation:
 - Reach out to PIs (immediate post-doc advisor, senior collaborators)
 - The specific job posting and the deadline should be readily available to them
 - Potential letter-writers: combination of faculty member(s) in and outside of the candidates' institution encouraged
 - Typically 3-5 letters are submitted
 - This process should ideally be started several months in advance

You met all the deadlines and submitted the application packages: what's next?

- Typically the process for long list interviews is quick!
- Sometimes candidates are contacted with a few weeks of the submission deadline
- Long list interview: often via zoom but sometimes can be an in-person invitation to give a seminar



- It's not that scary!
- Everyone understands that the candidate is nervous!
- I started doing well as soon as I pivoted to talk about my work

You met all the deadlines and submitted the application packages: what's next?

- Short list interview: invited for an in-person interview after the long list interview, sometimes a short list is directly made without the long list interview
- Requirements for in-person interview (over 2 days) vary but typically invited for:
 - **Seminar:** general enough but not a colloquium, typical audience consists of students, postdocs and faculty in HEP
 - **Colloquium:** general audience from various areas of physics
 - **Research plans:** very specific with the selection committee (convince why my research is absolutely crucial for the field, even structuring like a funding proposal could be useful)
 - **Teaching demonstration:** very specific to exact job
- Typical process: 1 or 2 of the above presentations have to be prepared (rare cases: 3)

The job talk!

- The job talk is usually scheduled in the late afternoon (~16:00 local time!)
 - “when the collective adrenaline and caffeine jolts have begun to subside” — from Berkeley Career Engagement
 - Many resources online regarding the actual talk
 - One common theme: cannot improvise, have talk prepared in advance and practice until the content is almost memorized
 - For reference: I wrote this talk this morning but my job talk was prepared at least a week in advance!
 - Even the jokes in the talk are often timed

Other aspects of the in-person interview

- Incredibly stressful two days with interviews scheduled in ~30 minute intervals
- Often the person you are talking to will walk you over to the next interview
- Interviews with the department chair and the Dean are often part of the process
- Prepare for long days: starts from breakfast and goes all the way to dinner

Getting an offer

- Typically contacted by the chair of the department to tell you the good news!
- Followed by either zoom or phone calls
- Often faculty members in the department reach out soon after
- Time to breathe and celebrate the moment (for a bit)!
- Next step is to put a start-up request together:
 - For me this was a personnel request (post-doc, graduate students)
 - Some equipment (for example, GPUs or lab space or lab equipment)
- Several back and forth expected, typically fringe benefits or university specific numbers are to be incorporated

Choosing between offers

- Congratulations on getting multiple offers!
- Many different criteria for choosing between offers (not in any order):
 - Synergy with the rest of the group
 - Advice from mentors
 - Geographical preference (family considerations)
 - Partner accommodations: “...has a particularly acute impact on women, in part because 43% of married female physicists are married to other physicists, whereas only 6% of married male physicists have a physicist spouse” — survey at William and Mary

Other aspect of startup negotiations

- Salary! Salaries for state universities are often available publicly
- Teaching relief
- At the same time important to find out:
 - Office of sponsored research — people who you will be working with closely for grant submission
 - Office space
 - Facilities — computers, monitors, backup disks etc.
 - Service duties
 - Tenure process

Congratulations! You are now an Assistant Professor or in an equivalent position at a National Lab!

- Breathe (again for a moment)!
- Start applying for external funding (university positions reliant on external funding)
- Lots of great PI - funding agency sessions at DPF-Pheno 2024:
 - Yesterday (May 13, 2024) at lunch time: <https://indico.cern.ch/event/1358339/sessions/542530/#20240513>
 - Ongoing right now!: <https://indico.cern.ch/event/1358339/sessions/542530/#20240514>
 - Ongoing right now!: <https://indico.cern.ch/event/1358339/sessions/542530/#20240514>

Other issues

- Immigration issues
- Feelings of inadequacy:
 - Imposter syndrome
 - Unsuccessful after a couple of job cycles
- Skewed work-life balance during the job search process
- Worrying about research productivity during the job search process
- These are real issues that are worth discussing
- Writing this talk has been cathartic!

I wish you the very best!