Professional development session tomorrow

Some homework…

Professional development @ B2SW25

Please answer the questions below and let us know what else you would like to discuss at the professional development session at the Belle II Summer Workshop.

What are the three things that cause you the greatest anxiety as you consider your professional future?

Your answer

What are your top two priorities for professional development in the near term (e.g. learn how to give a good talk, write a grant proposal, etc)?

Your answer

What are your top two career goals in the long term?

Your answer

- Please fill out the google form linked on the indico page under the professional development session tomorrow
  - We will focus on the things you want to hear, not the ones you already know

*If I don't look like Tom Cruise to you, please keep it to yourself

What are the three things that cause you the greatest anxiety as you consider your professional future?

- How many obstacles will there be for finishing my analysis?
- What to do after a postdoc?
- Will there be a job for me? Will there be funding? Am I qualified?
- What sort of non-academic jobs are available? Will the skills I've developed transfer?
- Instability within the field and funding.
- Work/life balance, family constraints, interpersonal issues.

What are your top two priorities for professional development in the near term?

- Physics intuition
- Computing skills (e.g. C++)
- Multitasking
- Staying involved without accepting too many responsibilities
- Writing and presentation skills
- Teaching skills
- Developing a focused research plan
- Understanding publication and grant processes
- Grant proposal writing (e.g. Ozaki or other Fellowships)
- Professional networking

What are your top two career goals in the long term?

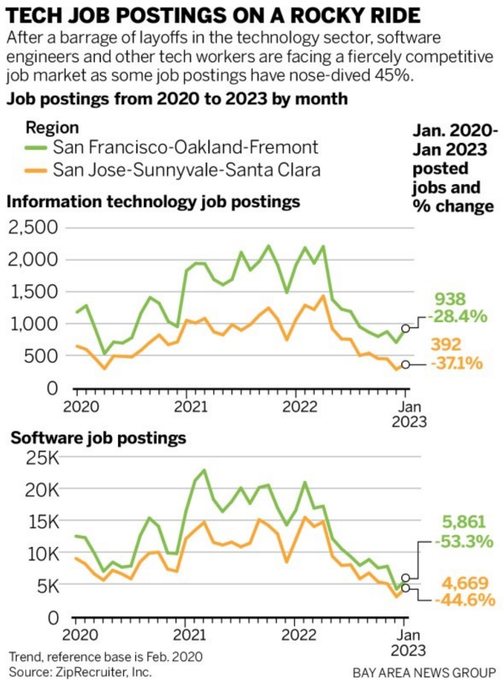
- Make an impact on Belle II
- Build a strong resume/skill set
- Get a degree
- Get a job
- Develop a strong research group
- Stability and fulfilling work

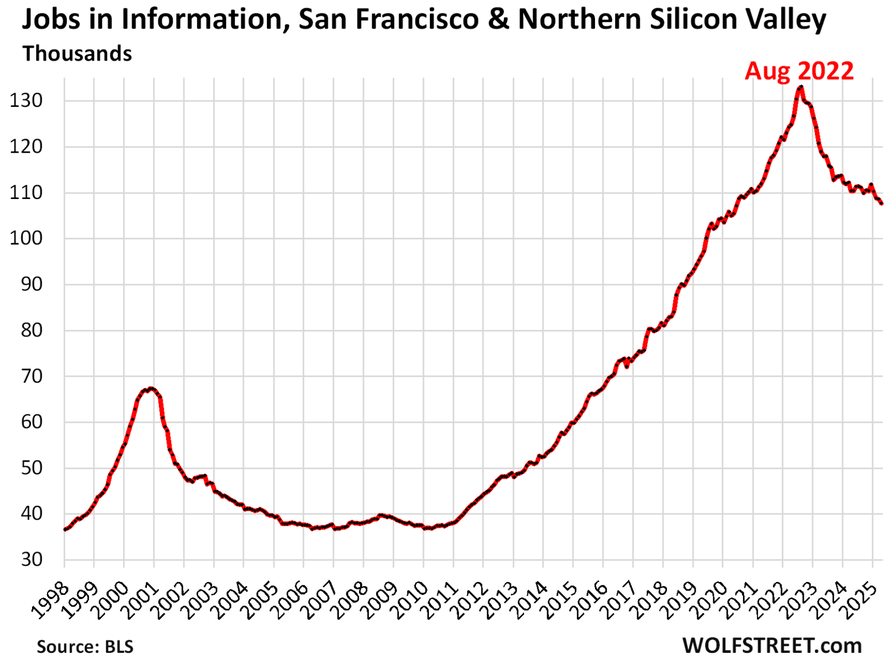
What other topics related to professional development would you like to discuss?

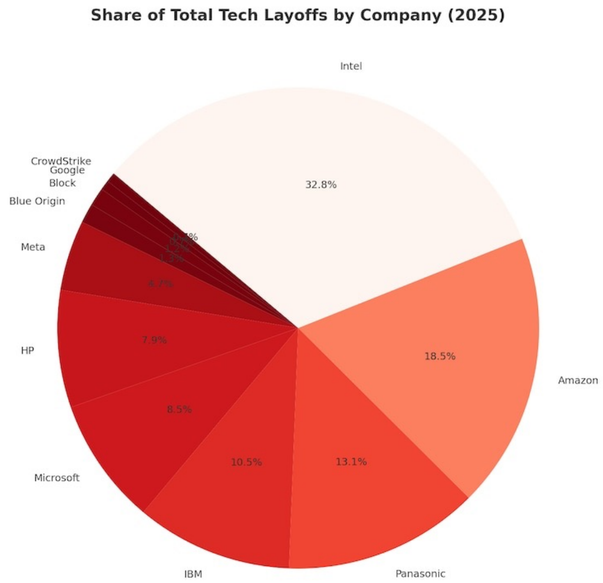
- Finding a job
- How to write a good paper
- At what point should I reach out for help, rather than working it out myself?
- How to ensure a research project is finished in a reasonable time frame?
- How to develop a research plan that is likely to be funded?
- How do you network with or get to know people outside your institution/collaboration?
- How to balance a career in physics with quality of life, family, or other obligations and priorities.

"The times they are are A-changin" – Bob Dylan, 1964
Data Science and Programming Entry Level jobs are no longer plentiful.

Replaced by AI bots ???







But there are some interesting growth areas that are well matched to HEP physics Phds.

AI/ML: Innovative AI/ML techniques, AI/ML on the front-end ("on the edge")

Quantum Computing: National Labs AND Industry.

Accelerator Physics: MDI (Machine Detector Interface). Shortage of accelerator physicists (x 3-4) too few according to the NAS. Electron Accelerators for chip making (EUV lithography, 13.6nm).

Academic hiring process in brief

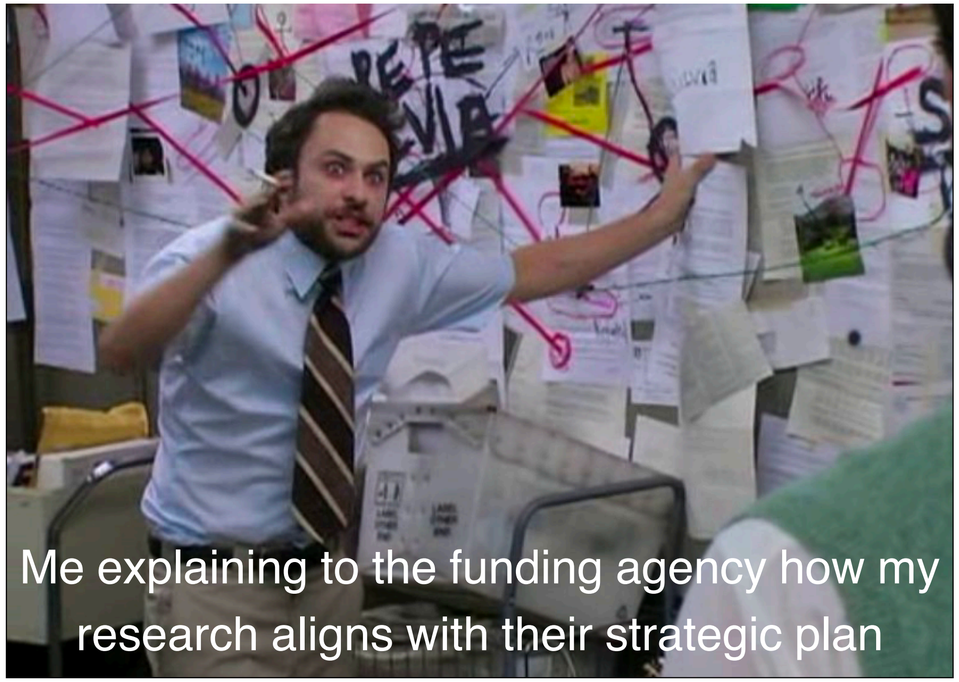
- Typically you will be asked for:
  - **Academic CV** Make yourself stand out!
  - **Cover letter/research statement** giving research interests, resources needed, and prospects for funding
  - **Teaching philosophy statement** Show that you know what you are talking about!
  - Universities are starting to ask for a **Statement on Diversity** specifying your plans to enhance diversity in your field
  - **Names** of those willing to write letters in your support Someone who knows your qualities!
- Read the advertisement carefully! Much can be learned and leave nothing requested out.
- **Take advantage of insider knowledge**. If you know someone or multiple someones do not hesitate to get in touch to ask how you should tailor your materials to be attractive to the search committee.
- Search committee reviews all the applications and determines a short list of those invited for **interview**
  - Colloquium talk Show that you can present your work clearly
  - Present your plans for research and funding Show that you put some thought into how your will conduct/fund your research
  - One-on-one interviews with faculty, deans These people will make the hiring decision…
  - Informal meeting with students …but these people give input and are the stake-holders!
  - Lunch/dinner Show that you are well-rounded and will be a good colleague

Example interview questions

- Tell me about your research.
- Your experiment has 1000 members and 1000 co-authors on every paper. What is your individual contribution?
- How do you plan to get funding for your research program?
- What University resources do you need to carry out that program?
- What is the long term prospects for the research you are doing?
- What will your research group look like? How does that fit in the with the existing group here?
- What is your favorite teaching experience?
- Tell me about your leadership activities.
- What do you do to relax/destress?
- Do you have any questions for us?

The funding process

- Sources of funding
  - **University start-up package**: supports your research until you get external funding (*you will be asked for a number*)
  - **Research funding agency**: US DOE, NSF, DOD, NIH, etc.
- Basis for funding decisions is peer review
- Typical funding time line is (DOE example):
  - Funding Opportunity Announcement (FOA) usually appears in July
  - Proposals are usually due in Oct, reviews Oct-November
  - Review Panels meet in December and January
    - Combine mail-in reviews and panel reviews
    - At least 4 reviews of each proposal



"Is it just me or are these review panels getting a lot tougher?"

- Standard basis of review is:
  - **Scientific/Technical Merit** - Is the science interesting and valuable?
  - **Appropriateness** - Are the methods being proposed proper?
  - **Competency** - Are the proposers competent to do the work?
  - **Budget** - Is the budget reasonable?
  - New emphasis: **quality and efficacy of recruitment and mentoring plan**

Advice

- **Get help!** The FOA is daunting. Starting from an existing template is essential.
- **Read the FOA carefully. Make sure all required is there.**
- You must be “Relevant”. Great proposals that are not on DOE/HEP mission do not get funded.
- Make sure you understand “overhead” (the institution usually gets 40-60%+ of the top-line amount)
- **Review your proposal before you submit**. Experienced colleagues, collaborators, university research offices often will help with proposal review services. University grant writing seminars can also be helpful. *Get in touch with your Sponsored Research Office*!
- **Start early to give time for review and revision.**
- Best proposals tell a coherent story of an interest leading to work on experiment X to do data analysis Y by methodology Z to get result A.
- **Talk to the relevant Program Manager**
  - Many agencies have Principal Investigators (PI) meetings annually and offer other workshops
  - Email for a one-on-one meeting
  - Advice up until proposal is submitted, then can only talk about process
  - Mock panel reviews are great for revealing how reviewers approach/fixate on details