

# Phys 7857 Graduate Seminar

## “How to get a job in physics”

Today: Postdoctoral positions

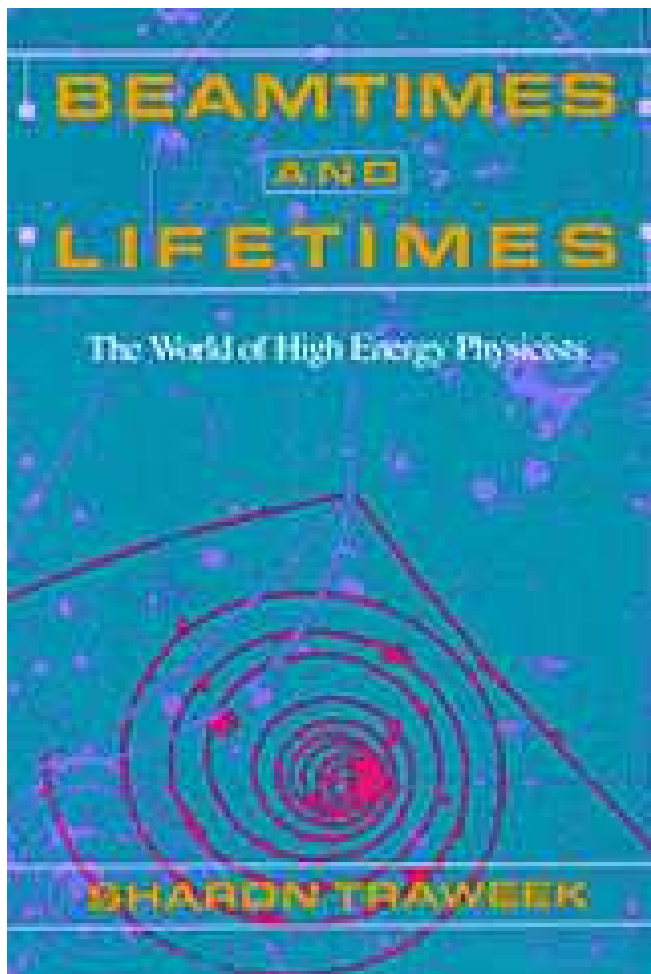
These days very few people who pursue a research career go to a permanent position immediately after obtaining their Ph.D. Such positions are either not available without postdoctoral training or suffer in quality without such training.

Usually these are positions that are for one year renewable to two (sometimes two with a third year). Rarely they are longer. What is clear is that the position is NOT to become permanent. The expectation is you will leave after it finishes.

The positions have little obligations beyond you doing research. It will perhaps be the period in your life in which you will be more focused on research. Some people relish nostalgically about such period later on in their careers.

But it is also a period with challenges. You will be for the first time “on your own” as a scientist. You will have to handle a relationship with your postdoctoral advisor, usually with little time to get to know each other well. Your advisors’ letter of recommendation will be very important in your finding your next job.

Finding your next job becomes a priority almost from day one. In two year positions you will be applying for your next job shortly after a year has elapsed since you arrived.



Sharon Traweek is an anthropologist that studied particle physicists using the techniques that anthropologists use to study tribes.

She characterizes the postdoc period as similar to that of the young warriors in a tribe who need to show the elder warriors they could kill them if they wished to, but without doing so.

## **Two kinds of post-docs:**

Postdoctoral positions can be classified roughly into two different kinds, depending on the source of funding.

In the “regular postdoctoral position” (for lack of a better name), the money comes to your postdoctoral advisor in the form of a grant. A portion of that grant is devoted to hiring a postdoctoral researcher to help with the topic of the grant. This model of funding is widely used in the US, more rarely in other countries.

In a “postdoctoral fellowship” a funding agency gives a grant directly to you for you to work under the advice of some postdoctoral mentor or group. The funding agency could even be from a different country (e.g. you get an NSF fellowship to do a postdoc in Paris).

Though in principle both types of arrangements provide for you do concentrate almost exclusively on research and therefore should matter very little, the reality is that the source of funding can influence how you interact and relate to your advisor and the research group surrounding her/him.

Human relations are not an exact science, and how your advisor will react to your source of funding will depend on the person. However...

If you are being funded through your advisors' grant, there will be a tendency for your advisor to evaluate your work in relation to how it advances the goals of the grant. In some cases this is very appropriate. For example, experimentalists usually get grants with specific goals e.g. using a piece of equipment or a given technique. You will be expected to use the equipment or the given technique in your work.

In other circumstances (e.g. theorists) things are more vague. Theoretical grants are based on specific proposals, but it is understood that the investigator has wide latitude to pursue worthy science, however unrelated it might be to the original proposal, within certain limits.

In a case like that, it will be less clear what you can or cannot work on as a postdoc. Some advisors take quite a laissez-faire attitude and let their postdocs pursue whatever research topic they want, knowing that if they produce good science that will reflect positively at the time of grant renewal. Other advisors tend to be much more protective, and will demand that you work on stuff that is more directly related to the goals of the grant. This may or may not be in your best interest career-wise.

In any event, the fact that you are an (important!) portion of the activity of a grant that is intended to be renewed means your advisor will watch over more closely what you are doing. It will also mean your advisor will probably want to ensure that you get a decent job after you are done.

If you are funded by a fellowship, you tend to have more autonomy. The autonomy will be greater the further separation there is between your source of funding and your advisor. This model is more common outside the US.

This can work the other way around. Particularly when you get funding from a foreign source, and if you are in a very active group, there might be the risk of you falling through the cracks and your advisor paying little or no attention to what you are doing. In particular, since due to visa regulations you will have to leave the country when you are done, the incentive to help you find a job after is lower.

On the other hand getting a fellowship is something you can put in your c.v. It was awarded to YOU, meaning certain level of prestige. Some fellowships come with perks, as a small allowance for travel or equipment.

## What kind of postdoctoral advisor?

It is not uncommon for people to get more than one postdoctoral offer. When comparing different offers, the stature or stage in the career of the advisor can be an important element, depending on your own personal goals and your personality.

If you go as a post-doc to work with a very senior figure (e.g. a Nobel prizewinner) or a member of the National Academy of Sciences, some of that prestige will no doubt rub off on you. On the other hand, such people tend to have large research programs with many post-docs and students. You will be one more in a crowd competing for attention. The atmosphere no doubt will be very competitive. Some people thrive in such environments. For others it can be a nightmare. Expect little in terms of mentoring and little concern for your future career prospects.

If you go work with someone starting in their career (e.g. an assistant professor), you will no doubt receive much more attention and perhaps share much more in the research of your advisor. Here the pitfall is that your advisor is trying to establish a reputation at the same time you are. Inevitably most of the credit of your joint work will go to your advisor since (s)he has many more opportunities to discuss the work with colleagues, etc. This happens even with the best of intentions.

## Does the institution matter?

The short answer is: little. Since the postdoctoral time you spend at a place is short, people realize the place has less chance of influencing you than, say, when you do a Ph.D. Therefore “having a Ph.D. from Caltech” is significantly more appreciated than “spent time as a post-doc at Caltech” prestige-wise.

More important is who you get to know (and who gets to know you). Some large places with very active visitor programs are definitely better intellectually and in terms of contacts for the future of your career.

Is a university better than a research institute? Since you will be concentrating on research, the most important things are the group that hosts you and potential visitors, especially close to your area of research. A university will offer a more diverse environment in a period where you probably are not too interested in getting distracted from your research. On the other hand, at research institutes it might be hard to get teaching experience, if you are interested in that (as we discussed in previous lectures).



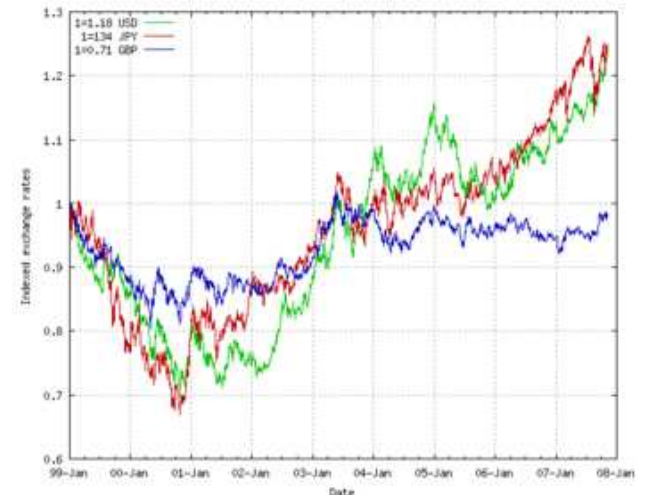
## Going for a postdoc abroad:

There are many opportunities to pursue postdoctoral fellowships abroad. These can range from postdoctoral positions associated with researchers' grants (just like those in the US) to positions based on fellowships that are given to you directly.

Going abroad may mean an adventure and an opportunity for personal growth for some. It may also mean a period of significant adjustment and culture-shock for others. This will depend largely on your personal circumstances.

Tourism vs. immigration. Do not assume that because you enjoyed walking the streets of Paris as a tourist, you will enjoy living there on a tight budget and going to work every day. This issue just gets harder the more different the culture is. This point is brought to the forefront as postdoctoral opportunities in China, India and other Asian countries, in the past a rarity, are now becoming more common.

Depending on the source of your funds, you could be hit with issues of currency fluctuations.



There might be issues associated with taxes. Some foreign countries are not readily equipped to deal with short term contracts for foreigners.

<http://www.nature.com/nature/journal/v407/n6802/full/407427a0.html>

For instance the European Union runs the Marie Curie Fellowship program. This program is for Europeans to take postdocs at European countries different from their own. Here are some excerpts from participants in the program:

Many fellows say that dealing with the administrative issues in a foreign country was simply too great a problem and took a lot of time. "I lost too much time with administrative questions and social security problems," says one fellow who participated in the anonymous survey. "Europe is not yet ripe for such a mobility."

And some fellows say host institutions, which manage the fellowship fund and pay the fellow's salary, are taking money that they are not entitled to have. Another anonymous MCFA fellow writes: "We need rigid, enforceable guidelines on what the host institution can and cannot do with the money."

Notice that this is for people moving *within Europe!*

There is also the issue of the “potential barrier” provided by the oceans (or more precisely, the cost of transportation) at the time of finding your next job.

If you want your next job to be back in the US, you will find yourself less exposed to potential US employers when doing a post-doc abroad.

If you want your next job to be more permanent than a post-doc, that will usually mean jobs where you have to interview in person. Many institutions will balk at funding the trip for an interview for someone outside the US and you may be passed over as a candidate if there are other equally suited candidates.

It is usually wise to coordinate a visit to various groups in the US close to “job searching season” so you can give talks and get exposure. Usually if you write to a research group saying “I will be in your area on such and such dates, could I come give a talk? I would appreciate if you could help with local expenses” many groups will oblige. The visit will still cost you the airfares, but usually there are possibilities of keeping costs low with promotional tickets that throw in some internal flights for free if you buy the international ticket, or renting a car and driving, etc.

## **The application process:**

Postdoctoral positions usually are advertised in trade journals like Physics Today, but unlike faculty jobs, not every position is advertised. In many research communities there are mailing lists or websites that list positions.

Usually the application process entails sending a cover letter, a c.v., a statement of research interests and arranging for three letters of recommendation to be sent (in faculty jobs one usually supplies names of letter writers only). Yes, this means your letter writers will probably be writing many letters for you (and other candidates), but this is accepted as part of the business, don't be shy. All of this is now changing as many places are moving to online applications. Things are in flux.

Although the caveats we discussed (and will discuss further later in the course) for preparing c.v.'s, letters, all apply, people are more forgiving in the case of postdoctoral positions if you do a poor job of presenting stuff. Usually the decision will be based on the letters of recommendation you get.

For fellowships the application process is less standardized. They are not advertised in a centralized way, you will have to find them. Here are some examples:

The National Science Foundation has fellowships for US citizens and permanent residents to pursue postdoctoral experiences abroad. Deadline early October.

[http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf06582](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf06582)

They only offer 35 fellowships in all areas, but there are not many physics applicants.

The Marie Curie Fellowship program is for EU citizens to go to an EU country different from their citizenship

<http://cordis.europa.eu/mariecurie-actions/eif/home.html>

The Royal Society in the UK has several types of fellowships. Limited to scientists “related to” the EU, they are in the process of expanding to include other countries

<http://royalsociety.org/page.asp?id=1112>

NSERC in Canada has fellowships for Canadian citizens, both for work in Canada or abroad [http://www.nserc.gc.ca/sf\\_e.asp?nav=sfnave&lbi=3a](http://www.nserc.gc.ca/sf_e.asp?nav=sfnave&lbi=3a)

Almost all of the major European countries have fellowship programs for foreign scientists. If you know of a group in such a country, you may want to contact them informally for advice on them. They may be very happy to help you, since you will be an extra resource for their group if you get the fellowship. On the other hand, In some cases the application process can be burdensome for the host institution. You may want to inquire, since it could be very impolite if you have them go through red tape to get you a fellowship and then you do not accept.

In general, fellowships require at the very minimum a letter from the host group stating that they are eager to take you, so it is a good idea to get in touch with the potential host significantly in advance.

## “Labor relations” and postdocs

Postdoctoral positions are a relatively new creation (early 1970's), compared to other positions in universities, which have been around for hundreds of years.

This means that institutions may have widely varying interpretations of the status as employees of postdocs. This gets further compounded by the fact that if you are getting a fellowship from external sources you are not even an employee!

For example:

-My first postdoc was with a fellowship in a US institution. The institution did not even wanted to grant me a regular id card (they issued a “spouse” id card to people with fellowships). They offered a private, expensive and limite health insurance plan, different than that for employees. There were no retirement benefits.

-My second postdoc was at a US university where postdocs were called “ancillary faculty”. That last word meant they enjoyed all the job benefits of a regular faculty member (health plan, retirement plan, library and gym access, etc).

-The third institution I was at got so confused about the status of postdocs that they set up a special commission to investigate and generate a report. Among other findings: someone had been a postdoc in excess of 25 years!

-At LSU postdocs get the same benefits as faculty and staff, including vacation days!

-Apart from these mundane considerations, the main point is that as a postdoc one is somewhat unprotected in case of serious difficulties at the job (e.g. ethical or personal disputes with your supervisor). Although most supervisors are honest and seek the good of their postdocs, one should be careful. One is not in a good position to get into disputes.



# Summary:

- Postdoctoral positions are a necessary step in a research career.
- For the most part they are an exciting opportunity to broaden yourself, learn new things and be better prepared to face the challenges of a permanent position.
- They do present unique challenges that one has to watch out for.