



Academic jobs and fellowships

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Planning ahead

- ❖ Applying for jobs post PhD may seem a long way off.
- ❖ However, 3-4 years of a PhD passes very quickly!
- ❖ While the primary focus at this stage is on producing strong research, it is useful to understand how the academic job market works.

High energy theory

- ❖ Careers in high energy theory can be challenging:
- ❖ (i) (Inter)national mobility is usually required.
- ❖ (ii) It is very unusual to get a permanent job without several postdoc positions.
- ❖ (iii) Many permanent jobs in Europe are created by obtaining prestigious fellowships, such as ERC grants.

Types of postdoctoral positions

- ❖ There are two main types of postdoctoral positions:
- ❖ (i) Positions in research groups funded by group research grants or a specific researcher's grant.
- ❖ (ii) Personal research fellowships.
- ❖ High energy theory is unusual in that positions of the first type still (usually) give you the freedom to choose your own research projects.

International mobility

- ❖ High energy theory is a global field and moving not just countries but continents for jobs is usual.
- ❖ There are strong research groups all over the world: where would you be willing to live?
- ❖ If you apply only in one country, your chances are much lower.



Postdoctoral positions funded by
research grants

Hierarchy?

- ❖ Clearly somewhat subjective - the top group in your research area may not be one of the obvious ones but:
- ❖ Top US universities (IAS, Princeton, Harvard, Santa Barbara, Stanford, MIT, Caltech,...) are usually considered the strongest in high energy theory.
- ❖ Then top European groups; CERN; other North American groups (McGill, Perimeter, Washington, Vancouver,...); top global groups (Weizmann, KIPMU, Tata,.....)

Joint postdoc applications related to theories on the unification of fundamental interactions

Dear Postdoc,

This on-line application procedure combines the postdoc applications of a group of European institutes with research in theoretical high-energy physics related to the unification of fundamental interactions, in particular inspired by string theory, with relations to quantum gravity and supersymmetry in general. See a [\(non-exhaustive\) list of topics](#).

The applications can start on October 1, 2019 and the deadline for applications is on November 30. It concerns postdoc positions starting autumn 2020.

This webpage allows you to apply at once to all the following institutes.

Amsterdam : <http://iop.uva.nl/content/research-groups/strings/index.html>
APC, Paris : http://www.apc.univ-paris7.fr/APC_CS/fr/post-doctoral-position-theoretic...
Barcelona : http://icc.ub.edu/index.php?m=job&c=offers&op=frm_offers
Bern : <http://www.blau.itp.unibe.ch/jobs.html>
Brussel, VUB : <http://we.vub.ac.be/nl/theoretical-particle-physics>
Bruxelles, ULB : <http://www.ulb.ac.be/sciences/ptm/pmif/>
Central Italy node (Firenze - Parma - Perugia - Pisa) : <https://sites.google.com/site/centralitalynode/>
Copenhagen, NBI : <http://cms.ku.dk/nat-sites/nbi-sites/het/>
Crete : <http://hep.physics.uoc.gr/>
Durham : <https://www.dur.ac.uk/cpt/>
Groningen: <http://www.rug.nl/research/vsi>
Hannover : <https://www.itp.uni-hannover.de/555.html?&L=1>
Iceland: <http://math.hi.is/en/staerdfaedileg-edlisfraedi/>
Imperial College London : <http://www.imperial.ac.uk/theoretical-physics>
Leiden : <http://www.lorentz.leidenuniv.nl/>
Leuven : <http://fys.kuleuven.be/itf/groups/hep>
Milano-Bicocca : <https://www.fisica.unimib.it/it/ricerca/fisica-teorica/milano-bicocca-th...>
München LMU and MPI : <http://www.physik.uni-muenchen.de> and <http://wwwth.mppmu.mpg.de>
Nordita Stockholm : <http://www.nordita.org/>
Oviedo : <http://www.unioviedo.es/hepth>
Saclay (IPhT) : http://ipht.cea.fr/Pisp/string/index_en.php
SISSA : <http://www.sissa.it/tpp>
Southampton : <http://www.southampton.ac.uk/math/research/groups/string-theory.page#gr...>
Technion-Haifa : <http://phsites.technion.ac.il/strings/>
Tel Aviv : <https://physics.tau.ac.il/particle>
Torino : <http://www.strings.to.infn.it/jobs/>
Utrecht : <http://web.science.uu.nl/ITF/>
Weizmann : http://www.weizmann.ac.il/particle/High_Energy_Physics/

<http://inspirehep.net/collection/Jobs>

Jobs

56 records found 1 - 25 ▶▶ jump to record:

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- 1. 2019-06-13: [High Energy / Astroparticle Physics \(848\)](#) ([Antioquia U.](#) - South America) [Deadline: 2019-10-09]**
Postdoc - astro-ph, hep-ph, hep-th
[Detailed record](#)
- 2. 2019-06-10: [Theoretical and Mathematical Physics](#) ([Boskovic Inst., Zagreb](#) - Europe) [Deadline: 2019-08-01]**
Postdoc - hep-th, math-ph
[Detailed record](#)
- 3. 2019-06-07: [Particle and Astroparticle Physics](#) ([IIP, Brazil](#) - South America) [Deadline: 2019-07-15]**
Postdoc - astro-ph, hep-ph, hep-th
[Detailed record](#)
- 4. 2019-06-04: [QCD Theory and Phenomenology](#) ([Cracow, INP](#) - Europe) [Deadline: 2019-06-14]**
Postdoc - hep-ph, hep-th
[Detailed record](#)
- 5. 2019-06-03: [Theoretical High Energy Physics](#) ([Peking U., CHEP](#) - Asia) [Deadline: 2019-08-31]**
Postdoc - hep-lat, hep-ph, hep-th, nucl-th
[Detailed record](#)
- 6. 2019-06-03: [Theoretical Elementary Particle Physics](#) ([U. Montpellier 2, LUPM](#) - Europe) [Deadline: 2019-06-17]**
Postdoc - hep-ph, hep-th
[Detailed record](#)
- 7. 2019-05-22: [Optical Studies for Performance and Optimization of DUNE and the LZ Dark Matter Detector](#) ([LIP-Coimbra](#) - Europe) [Deadline: 2019-06-10]**
Postdoc - astro-ph, hep-ex, hep-lat, hep-ph, hep-th, physics.acc-phys, physics.ins-det, physics-other - [DUNE](#), [LZ](#)
[Detailed record](#)
- 8. 2019-05-22: [Marie Skłodowska-Curie Fellowships](#) ([Prague, Inst. Phys.](#) - Europe) [Deadline: 2019-06-21]**
Postdoc - astro-ph, gr-qc, hep-ph, hep-th
[Detailed record](#)
- 9. 2019-05-22: [FELLINI - Fellowship](#) ([INFN, Italy](#) - Europe) [Deadline: 2019-07-16]**
Junior, Postdoc - astro-ph, cond-mat, cs, gr-qc, hep-ex, hep-lat, hep-ph, hep-th, math, math-ph, nucl-ex, nucl-th, physics.acc-phys, physics.ins-det, physics-other, quant-ph
[Detailed record](#)

<https://academicjobsonline.org/ajo/physics>

Job Listings [[High Energy Physics](#)]

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All, [BSM new physics\(2\)](#), [Electroweak Symmetry Breaking\(2\)](#), [Experiment\(3\)](#), [Experimental\(2\)](#), [Flavor Physics\(1\)](#), [Higgs physics\(3\)](#), [LHC\(6\)](#), [Neutrino physics and Astrophysics\(1\)](#), [Physics\(2\)](#), [Theoretical Particle Physics\(5\)](#)

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Institute for Advanced Study, School of Natural Sciences

1. [MEMJVP] MEMBER OR JUNIOR VISITING PROFESSOR (2019/11/15) [Apply](#)



Los Alamos National Laboratory, Theoretical Division, T-2

1. [NTPD] Postdoctoral Research Associate in Nuclear Theory ([filled, deadline 2018/12/03](#))

Stanford University, SLAC HEP Theory Group

1. [RA] Stanford-SLAC HEP Theory Group RA (2019/12/01) [Apply](#)
2. [THSTAFF] Staff Scientist ([deadline 2019/05/15](#)) [Apply](#)

University of Copenhagen, Niels Bohr International Academy

1. [HEP_PDRF] Postdoctoral Fellowships in High Energy Physics ([accepting applications](#)) [Apply](#)



(5 positions listed)

Timelines

- ❖ Application deadlines by end of November.
- ❖ Note early deadline for CERN applications!
- ❖ Offers made mid December through to end of January.
- ❖ No offer has a deadline before January 7:
<http://insti.physics.sunysb.edu/itp/postdoc-agreement.html>

Publications

- ❖ Students sometimes think that applications are ranked by the number of publications.
- ❖ Usually not the case: ground-breaking, original work wins over a large number of incremental papers.
- ❖ How important is it to work in a topical area and to have high citation rates...?

Application procedure

- ❖ Standard requirements:
 - ❖ (i) CV and publication list
 - ❖ (ii) Research statement
 - ❖ (iii) Three recommendation letters
- ❖ Some jobs may have additional requirements e.g. customised letter of application, explaining fit with group.

Research statement

- ❖ A formal research proposal is not required of fellowships.
- ❖ A research statement should be 2-3 pages, describing the key results of your PhD and your future research plans.
- ❖ We are looking for independence; viable research projects; possibility to collaborate.
- ❖ Don't just write about specific (narrow) follow ups of your current work!

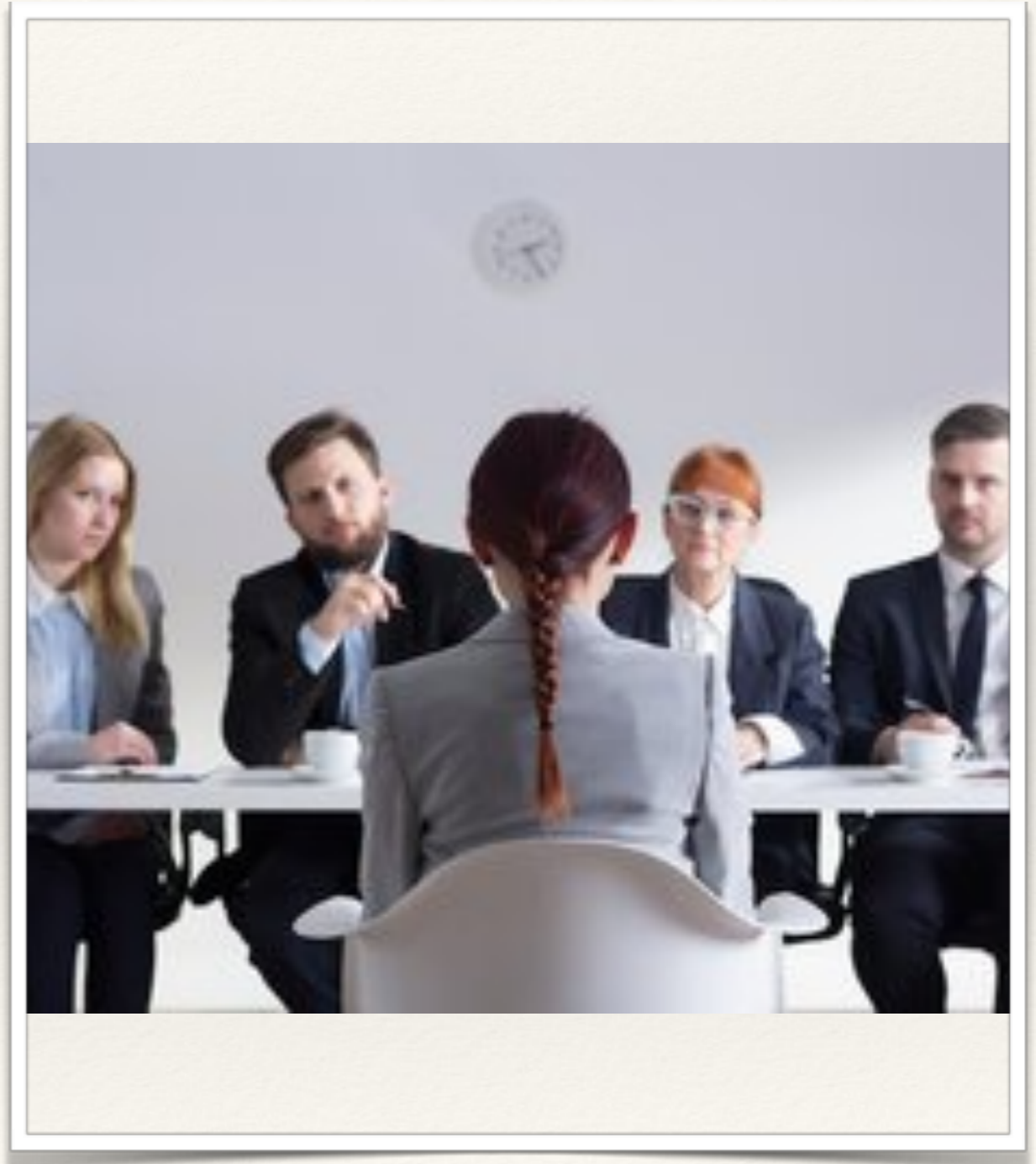
Recommendation letters

- ❖ Recommendation letters play a crucial role for graduating PhD students.
- ❖ Try to interact with other staff in your group, apart from your supervisory team.
- ❖ The more we know you, the more we can write about you!



Interviews and job tours

- ❖ Postdoctoral positions almost never interview: offers are made on the basis of application only.
- ❖ It is common for candidates to ask to visit institutes and give talks, usually funded partly by their home institution.
- ❖ This is an opportunity to sell yourself and network.



Dos and Don'ts

- ❖ Do apply to a range of departments: each job will have 100-400 applicants.
- ❖ Don't apply at the last minute: staff are busy and need time to write recommendation letters!
- ❖ Don't delay applications until a particular paper is finished - put in the application and then finish the paper.

Job offers

- ❖ Earliest offers are mid December, made by top institutes.
- ❖ An unofficial rumor mill keeps track of offers:
<https://sites.google.com/site/postdocrumor/>
- ❖ Typically a few candidates will get multiple offers in the first round.
- ❖ When they make decisions on January 7, second round offers cascade down to other applicants.



Etiquette

- ❖ Decisions are binding: one cannot accept an offer and then later turn it down for a “better” post-doc.
- ❖ There is usually very little room for salary negotiation, nor discussion about relocation expenses, pensions etc.
- ❖ The length of the position is usually fixed at 2 or 3 years, with some positions being 2 + 1, dependent on performance and future funding.
- ❖ Ask for advice when comparing offers!

Strategic considerations

- ❖ If the postdoc is on associated with a personal grant, would you be expected to work with the grant holder?
- ❖ Are there potential collaborators in the research group?
- ❖ Would you be able to branch out in new directions, rather than continuing with PhD work?
- ❖ Plus personal considerations....

Fellowships

Research fellowships

- ❖ Fellowships are awarded to researchers by funding bodies such as research councils & by Oxbridge colleges / prestigious schemes at other universities.
- ❖ A fellowship will provide your salary for 2-4 years, as well as travel funds and computing equipment.
- ❖ You will apply with a host research group but you will be able to pursue your own research.

Examples of early career fellowships

- ❖ Oxbridge College fellowships (2-4 years)
- ❖ UKRI Stephen Hawking fellowship (4 years)
- ❖ EPSRC Mathematical Physics fellowship (3 years)
- ❖ Royal Commission 1851 fellowship (2 years)
- ❖ EPSRC Doctoral Prize fellowships (now usually 2 years)
- ❖ Unfortunately STFC removed its early career fellowship scheme in 2010 due to financial constraints.

Outside the UK

- ❖ INFN fellowships (Italy); NWO Veni fellowship (Holland); FWO/FNRS fellowships (Belgium); JSPS fellowships (Japan); Marie Curie COFUND schemes around Europe....
- ❖ Typically EU Marie Curie fellowships and CERN fellowships would require at least one prior postdoctoral position to be competitive.
- ❖ Five year fellowships are “tenure track” and normally require 5+ years of postdoc experience.

Application procedure

- ❖ Specific procedure for each type of fellowship - time consuming!
- ❖ However, all require a formal research proposal.
- ❖ This is very challenging: the fellowship committee will never consist of only high energy theorists, so your proposal must impress non-experts and also convince expert referees.
- ❖ Ask for examples of previous successful proposals!

Why fund high energy theory?

- ❖ In a fellowship proposal, you need to present a vision of novel and important research.
- ❖ Inherent vulnerabilities of high energy theory: (i) lack of experimental verification; (ii) lack of impact outside academia.
- ❖ Nevertheless fellowship committees do support high quality, blue skies research.

Lack of big picture and “In Universe”

- ❖ Fellowship proposals from high energy theory often assume too much background knowledge and do not give clear “big picture” motivations for projects.
- ❖ They can be inaccessible to researchers who aren't in the string universe.



Example: anomalous supersymmetry

- ❖ Recent work with Katsianis, Papadimitrou and Skenderis: supersymmetry is anomalous in 4d $N=1$ theories with anomalies in R or flavor symmetries.
- ❖ Proposal: study analogous anomalies in other dimensions and for extended SUSY; descent relations; implications for “BPS” spectrum.
- ❖ These specific goals must be explained and put into context, with clear motivations....

Example: anomalous supersymmetry

- ❖ What are the physical implications of anomalies in general? Why are anomalies in supersymmetry unexpected? Why are we still studying supersymmetry when LHC has found no signs of supersymmetry at TeV scales? What are the likely implications of the new supersymmetry anomalies? If localisation, why do we care about localisation and studying QFTs on curved manifolds? Why explore these specific questions?

Timelines for research

- ❖ In many research areas, it is very sensible to plan out research in detail, with specific milestones and deliverables.
- ❖ Accordingly, most fellowships ask theoretical physicists to provide such timelines.
- ❖ This makes very little sense: goals change; other groups publish related results; ambitious projects often end up switching direction..... but you need to do it.

Viabile projects

- ❖ Your project should be viable, with reasonable timelines included in Gantt charts e.g. 3 papers per year (not 1 or 10!).
- ❖ Non theorists (even professors) simply do not understand that theoretical work cannot be planned in minute detail, years in advance.

Work schedule – Gantt chart

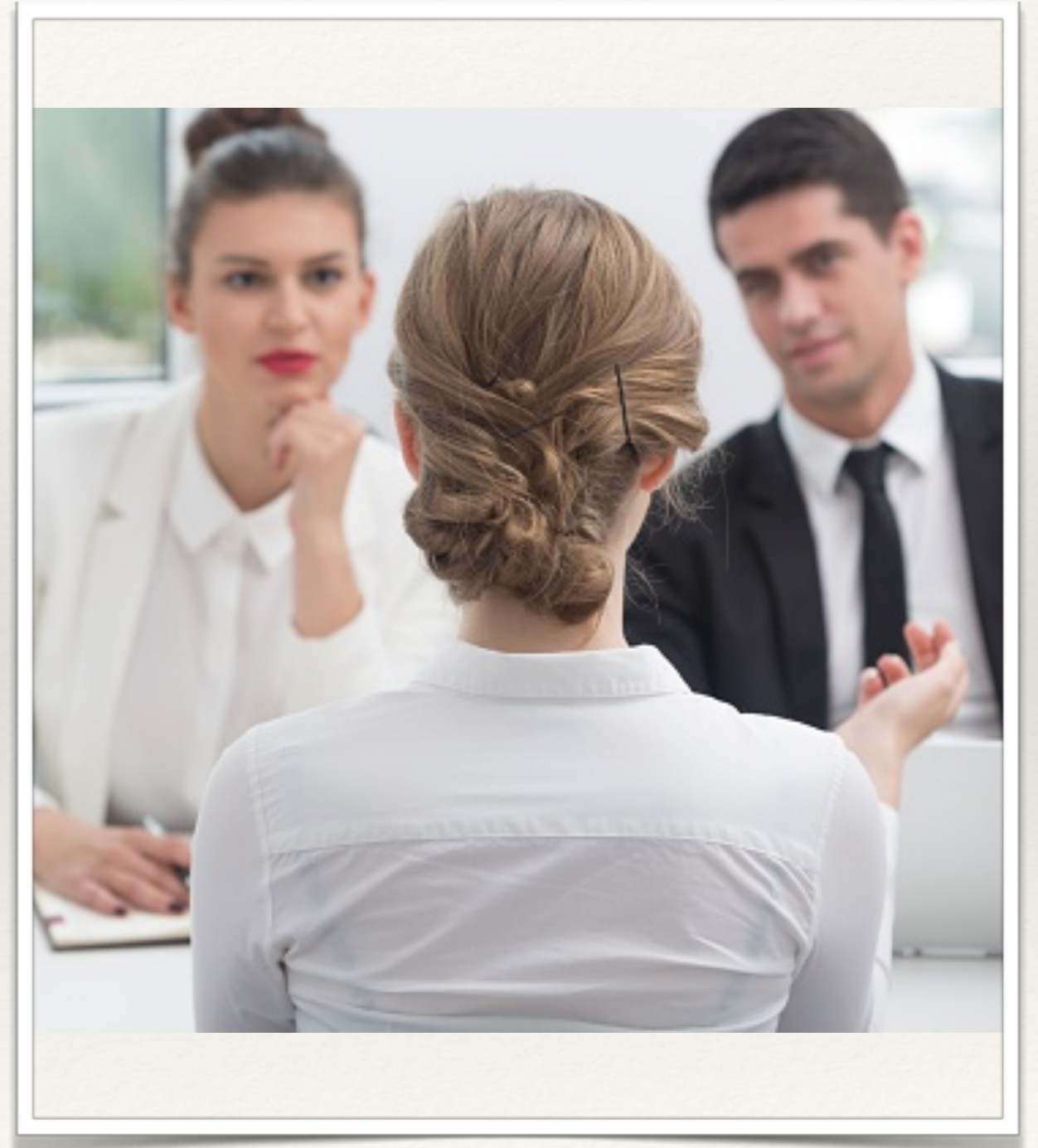
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April
Identify research area								
Formulate research questions								
Formulate research strategy, research design and select methods								
Write research proposal			15th					
Negotiate access								
Literature review								
Data collection								
Data analysis								
Write first draft								
Write second draft								
Write final draft								
Dissertation due								21st

Fellowship assessment

- ❖ Panels sift applications, often in two stages, with second stage following peer review by experts.
- ❖ Don't annoy reviewers unnecessarily: cite appropriate literature; don't make wildly ambitious claims; avoid criticising previous work (build on it instead....).
- ❖ Fine balance between selling big picture to panel and providing enough detail to expert referees, all within word limits - iterate drafts!

Interview phase

- ❖ Some early career fellowships interview short listed candidates.
- ❖ You will often be asked to prepare a short presentation, which will be followed by questions from the panel.
- ❖ Focus more on the big picture and make sure your presentation keeps to time!



Interview tips

- ❖ Do your homework: look up the interviewers, so you know their research areas.
- ❖ Don't talk down to them, but don't assume that they will be experts in your area.
- ❖ Avoid obvious mistakes e.g. high energy experimentalist stating confidently that di-Higgs models come directly from string theory... but then being completely unable to explain this claim.

Interview questions

- ❖ What do you want to achieve by the end of this fellowship?
- ❖ How will this fellowship enable you to become a leader in your research area and advance your career?
- ❖ What is your vision for building a research group and diversifying your research portfolio?

Added value of fellowship applications

- ❖ Even if unsuccessful, you will learn a lot.
- ❖ Writing full research proposals is good practice for writing research grants.
- ❖ You will reflect on your own work, the research field and where you would like your career to go.
- ❖ You will usually need to write about impact and public engagement, setting your work into a wider context.

Resilience

Dealing with rejections

- ❖ The postdoc and fellowship market is highly competitive.
- ❖ You should not take it personally when you get rejections - everybody does.
- ❖ Remember: even Witten wasn't offered tenure at Harvard following his postdoc there

Plan B and C and....

- ❖ Not uncommon to delay graduation for a year and reapply in the next round (but unfortunately not usually an option in the UK, due to funding and pressure for students to complete within funded period).
- ❖ The fellowship cycles are out of phase with the hep theory postdoc rounds - people often apply for fellowships if they don't get a good postdoc offer.

Postdocs in neighbouring research fields?

- ❖ The high energy theory community is rather self contained but nonetheless students sometimes get postdoc positions in neighbouring fields (condensed matter theory, gravity, mathematical physics, quantum information) and effectively cross over into other areas.
- ❖ Would this be preferable to non-academic jobs? No penalty in applying...
- ❖ Note that the job market in neighbouring areas is very different: academic jobs in “data science” within 2 years of graduation.

Teaching positions

- ❖ Sometimes there may be an option for a postdoctoral position that involves teaching.
- ❖ This is very common in other areas of academia (particularly humanities) but less common in hep theory.
- ❖ Would you realistically have enough time for research?

Mentoring

- ❖ Students vary considerably in how much they ask for mentoring and advice.
- ❖ Your supervisory team are there to help you....
- ❖ And you can also approach senior staff elsewhere in the department and at conferences.
- ❖ The onus is on you: staff are busy & won't usually come and volunteer their help.

Summary

- ❖ The high energy theory postdoc market is challenging.
- ❖ Gather information to make informed decisions!
- ❖ Of course there are many great jobs outside academia... look “behind the horizon” to understand what a permanent position in academia is like these days.