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Geometry, Analysis and Gravitation group



Science & Technology
Facilities Council

Plan

- Personal history of grant success and failure
- Brief overview of:
 - Stephen Hawking Fellowship (UKRI - i.e. STFC + EPSRC)
 - Ernest Rutherford Fellowship (STFC) (similar to EPSRC Open Fellowship)
 - University Research Fellowship (Royal Society)
- Tips (focus on interview stage)

Personal grant history

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- 2019/20 - UKRI Stephen Hawking Fellowship
(**failed at interview stage**)
- 2020/2 - STFC Ernest Rutherford Fellowship
(**success!**)
 - Royal Society University Research Fellowship
(invited to interview but had to **withdraw**)
- 2021 - Co-applicant on Leverhulme Trust research project grant
(**success!**)

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What changed
here?



The grants

UKRI Stephen Hawking Fellowship

- 10 x 5 year fellowships available each year for UKRI (EPSRC and STFC) remit
- Target applicants: Postdoctoral researchers who demonstrate they can **make significant contributions in the field of theoretical physics** and **spark public interest** in their chosen field.
 - Recent PhDs / postdocs with 1-3 years of experience (can't apply to both, more junior than ERF)
 - Theoretical physics is broadly interpreted (from solar physics to string theory)
 - develop your skills in public engagement and science communication (not required to have such skills already)
- Steps:
 - Need a host institution - number of places supported not limited
 - Outline proposal first in September/October
 - If successful, full proposal in January/February - CV, research proposal, references
 - If successful, interview in July, decision in August

STFC Ernest Rutherford Fellowship (~ EPSRC Open Fellowship)

- 10 x 5 year fellowships available each year for STFC remit
- Target applicants: Outstanding researchers at an **early stage of their career**. The aim is to support **future scientific leaders** to establish a **strong, independent research programme**.
 - More senior postdocs with 3-10 years of experience
 - Need to show you are ready for responsibilities of a permanent position (teaching ability etc)
- Steps:
 - Need a host institution - number of places per department limited: Departments have internal processes to select candidates to support in advance of the STFC closing date. (Departments should not expect you to accept an offer to be hosted before 19 August.)
 - Full proposal due in September - CV, research proposal, references
 - Respond to reviewer comments in November/December
 - If successful, interview in February, decision in March

Royal Society University Research Fellowship

- 30 x (5+3) year fellowships available each year (across all of science / maths)
- Target applicants: support the **most promising early career postdoctoral scientists** to build **independent research careers** and give them the **freedom to pursue innovative and often transformative scientific research**.
 - More senior postdocs with 3-10 years of experience
 - Focus 100% on research and more innovative / risky than ERF
- Steps:
 - Need a host institution - number of places not limited by department, but still competitive
 - Full proposal due in September - CV, research proposal, references
 - If successful, interview in March, decision in May (after ERF, so potential for conflict)

Tips

How to be a kung fu grand warrior



Katy's how to be a kung fu grant warrior

- Know your worth
- Find the fun in your work
- Help other people
- Ask mentors for help
- Preparation



Preparation 1: The presentation

- 10 minutes means 9 minutes
- Don't learn it by heart (or read it on a screen) because it will sound unnatural (although I do usually learn the first slide by heart so I get into the flow)
- Keep it simple. You only need to communicate 3 things:
 - Why this is work worth doing?
 - Why are you the best person to do it?
 - Why is now the right time to fund it?
- Practise your presentation to people from inside and outside your immediate field of research and ask them if they can answer these points afterwards

Preparation 2: The questions

- Think like an interviewer - what do they want to hear?
 - Something specific
 - Something memorable / impactful
 - Something that ticks the box
- The boxes are mostly the same as those for the presentation, ok to repeat your messages but elaborate a little
 - Why this is work worth doing?
 - Why are you the best person to do it?
 - Why is now the right time to fund it?
 - + What are the risks / guaranteed returns?
- You are not required to give full disclosure, it is ok to focus on the best aspects

Preparation 2: The questions

- Example:
 - **Question:** What do you see as the biggest risk in your project?
 - **What does this really mean?** If we give you the money, what could go wrong, what is the minimum we get out of this?
 - **Don't say:** Numerical relativity simulations of modified gravity theories beyond $f(R)$ haven't been completely figured out, for some models we don't have a well posed formulation, and this means that constraint violation can grow rapidly and spoil the simulations....this is a very interesting open problem and solving it would have a big impact on the field.
 - **Do say:** I need access to high performance computing resources to undertake my simulations. Around **2/3rds of the proposal can be performed** with local resources which I am **guaranteed** to have access to at Cambridge, and these projects would already have a significant impact. The remaining projects rely on applications to national or European resources. I have **successfully obtained two such grants** in the past two years and have recently been made a **member of the panel** that assesses national HPC grant applications, so (whilst I can't assess my own application, ha ha ha) I am **confident** that the resources can be obtained.

Preparation 2: The questions

- Example:
 - **Question:** How does your work differ from that of these competitor groups?
 - **What does this really mean?** Leadership, uniqueness, ambition, drive - why YOU?
 - **Don't say:** I don't consider these people my competitors, we discuss and collaborate widely and I think their work reinforces mine and vice versa.
 - **Do say:** **As I mentioned in my presentation,** numerical methods can tackle problems that analytical methods can't reach because perturbation theory breaks down, so using these we can explore the regimes where length scales are similar, which is often where **the most interesting non linear effects** can be found. Whilst there are a **handful of other groups internationally** who could do these simulations, most are **focussed on standard astrophysical problems** - few have the **experience of applying the same methods to cosmological spacetimes** that I have. I can actually think of only **one other person with comparable experience**, and in that case their code is **not open source** and they don't benefit from the **large community of users** that I have in my collaboration.

Questions?