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HOW TO WRITE COMPETITIVE RESEARCH PROPOSALS

CARSTEN P WELSCH



Overview

- Background
- How to find grant writing opportunities?
- How to write a competitive grant?
- Examples
- Why is a grant awarded?
- Challenges in collaborative/international projects
- Frequent problems

My own track record...

- Funding from DPG, HGF, RSE, STFC, RS, EU, etc.
- Initiator and Coordinator of 5 Marie Curie ITNs:



(Beam Diagnostics, Physics)

4.2 M€, 22 Fellows, 32 partners



(Laser Applications, Engineering)

4.6 M€, 22 Fellows, 38 partners



(Accelerator Optimization, Physics)

6 M€, 23 Fellows, 35 partners



(Medical Applications, Life Sciences)

3.9 M€, 15 Fellows, 31 partners



(Antimatter R&D, Physics)

4.0 M€, 15 Fellows, 24 partners



Largest training initiative in the world.



Also coordinator of...

- Silicon Photomultiplier R&D *(2013-15)*
- Optical Beam Diagnostics *(from 2014-16)*
- Next-gen. Antimatter Research *(from 2014-16)*

SiPM 

DITA-IIF 

BeaPhy 



More than 50 M£ of funding
in past decade.

Ideal: mix of funders & activities

- CI core grant
- AWAKE-UK
- HLLHC-UK
- FCCIS
- OASYS
- ARIES/OMA/AVA/...
- ALPHA
- Physics of Star Wars, HEIF
- Fellowships, IAA
- Etc.

Equally important: Failures!

- Most grants are not successful! I was not awarded +100M£!
- In most funding schemes, feedback can help make an idea more competitive and eventually be funded;
- Own track record of 'failures'
 - MSCA YI award, HGF, ERC StG,...
 - ITN/EDP/IIF/EIF/...Annus horribilis: 2014
 - Tech transfer grants, IPS, IPS again,...
 - Outreach and communication grants, e.g. MSCA night, STFC, Leverhulme Centre
- Writing grants is an important task – it gives us the freedom and flexibility that we want and need.
- Disclaimer: This is a lot of work!

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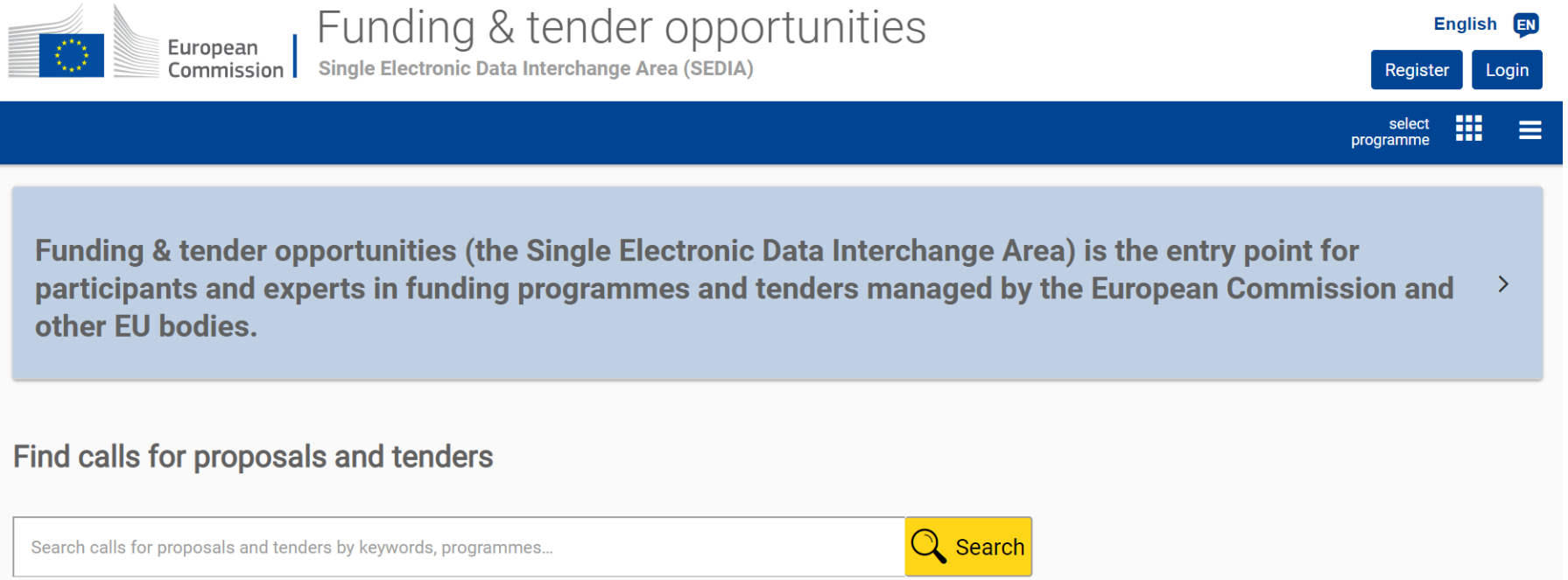
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HOW TO FIND GRANT WRITING OPPORTUNITIES?



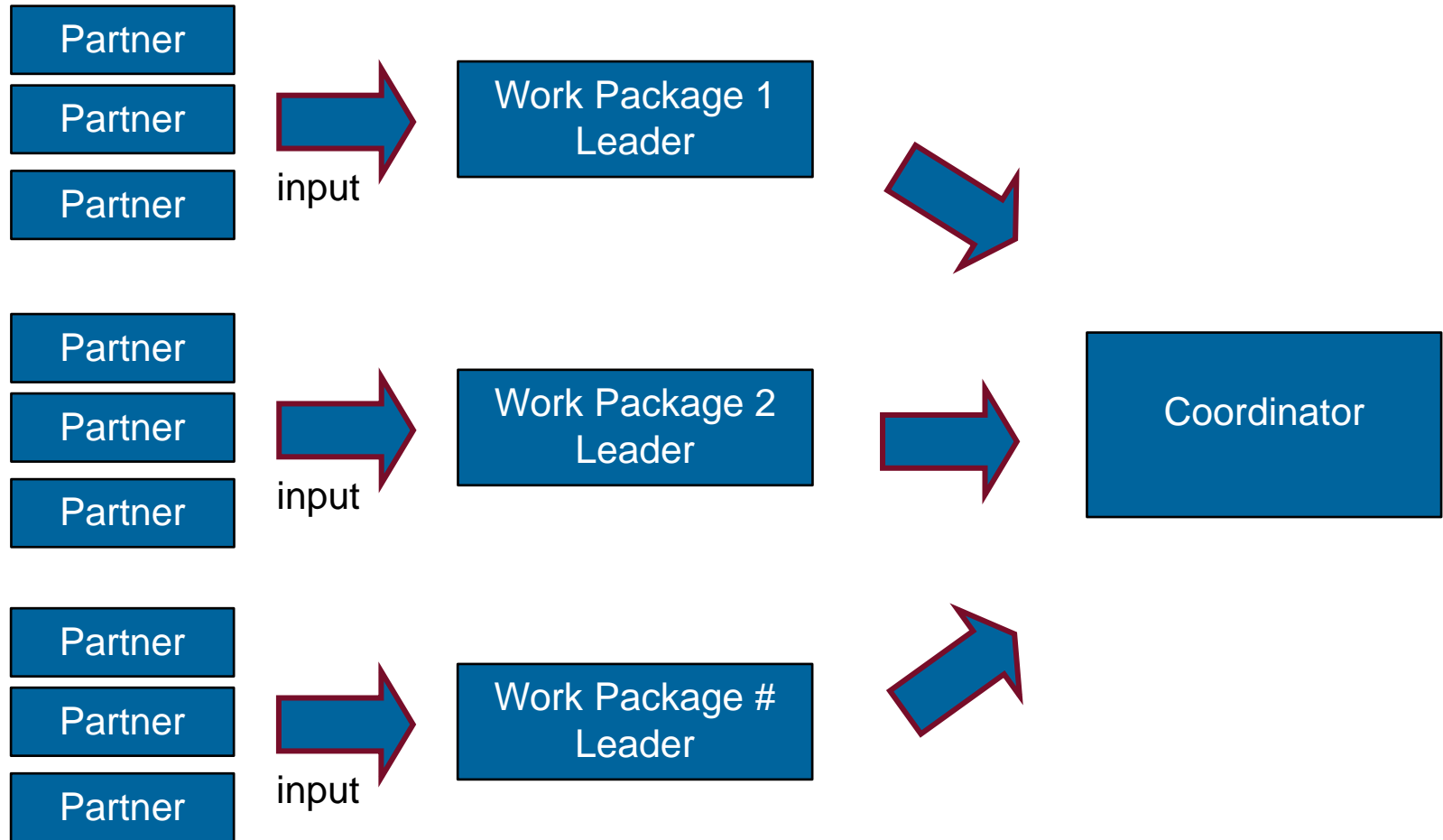
EU funding: Needs online account



The screenshot shows the top of the European Commission's 'Funding & tender opportunities' website. The header includes the European Commission logo, the text 'Funding & tender opportunities', and 'Single Electronic Data Interchange Area (SEDIA)'. On the right, there are links for 'English', 'Register', and 'Login'. Below the header is a blue navigation bar with a 'select programme' dropdown and a menu icon. The main content area has a light blue box with the text: 'Funding & tender opportunities (the Single Electronic Data Interchange Area) is the entry point for participants and experts in funding programmes and tenders managed by the European Commission and other EU bodies.' Below this is a section titled 'Find calls for proposals and tenders' with a search bar containing the placeholder text 'Search calls for proposals and tenders by keywords, programmes...' and a yellow 'Search' button.

- No account – no proposal and no grant!

How a proposal is compiled (EU)



Success criteria

**Best
Science**



From telling to selling (to evaluators)

**Best
Partners**



Coordinator (Key issue)

Impact



Policy to programmes to projects

**Professional
Support**



Excellent research needs excellent support services.

Important web pages

- <https://stfc.ukri.org/funding/research-grants/funding-opportunities/funding-calls/>
- <https://royalsociety.org/grants-schemes-awards/grants/>
- <https://epsrc.ukri.org/funding/>
- http://cordis.europa.eu/home_en.html

- <http://www.researchprofessional.com>
- <http://www.linkedin.com>

Homework

- Spend 10 minutes identifying current open calls in your host country and/or CORDIS
- What funding is offered?
- What are the requirements on the PI?
- What information is provided?

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HOW TO WRITE A COMPETITIVE GRANT?



Important questions

- What is the difference between grant applications and other kinds of research writing?
- How should these differences affect the nature of the document?
- Why do research funders give grants and fellowships?
- What are the differences between grants and fellowships?

<http://www.researchfundingtoolkit.org/blog/>

Why is a grant awarded?

- Does the research project deserve investment?
- 4 propositions that address 4 key questions
 1. **IMPORTANCE:** Problem and project are important to the funder, as defined by them
 2. **SUCCESS:** The project promises a solution
 3. **VALUE:** The resources requested are:
 - Necessary
 - Sufficient
 - Appropriate to the scale of the problem
 4. **COMPETENCE:** PI, team and institution are capable of carrying out the project

Supporting the 4 propositions

- **IMPORTANCE**
 - Evidence that the research question is important
 - Information about the project, institutions and investigators
 - Information about indirect outcomes
- **SUCCESS**
 - Details of research activities and methods
 - Mapping of activities onto question and sub-questions
 - Dissemination plans
- **VALUE**
 - Description of how requested resources will be used
 - Justification for choice of resources
 - Description of how other resources are used in the project
- **COMPETENCE**
 - Evidence that the team has the necessary skills
 - Evidence that the institution
 - Supports researchers
 - Has managed projects likes this before

Fellowships: what's different?

- IMPORTANCE

- often have special requirements
 - Supporting Stars or Future Leaders
 - Learning new techniques
 - Taking techniques to other labs

- VALUE

- often a strong expectation that major costs of research will be provided elsewhere

- COMPETENCE

- often an expectation that competence will be developed by the Fellowship

How to evidence importance?

- Summary/Abstract
 - States importance of question
- Case for support
 - Context/Background/Research that has led up to the project
 - Gap in the literature is NOT enough
 - Gives detailed evidence for the importance of the question
 - Provides evidence of International standing/leadership
- Description of the project
 - Supports developmental + skills transfer aspect of Fellowship
- Statements of support
 - Support special aspects relevant to Fellowship

How to evidence competence?

- CVs and description of research team
 - (high impact) papers provide evidence of research skills
- Evidence of distinctive strengths
 - Methods we have developed ...
- Description of research environments
 - Provide evidence of institutional uniqueness
- Assessments/Statements of support
 - Provide evidence of institutional support

Exercise: First steps...

- Individually:
 - Based on your current R&D project, identify three different aspects on which you could base a grant application.
 - What partners would you involve (if any) ?
 - What amount of funding would you require ?
 - What do you need the funding for ?

Write this down.

Grants versus Papers?

- To persuade reader that the world needs your research
 - NOT to persuade reader that your theory is correct
- A panel of highly successful people who are not experts in your field plus some reviewers who may or may not be experts in your field
 - NOT some specialist reviewers and an editor
- Low motivation to understand what you are saying
 - NOT somebody who will fill in the blanks for you if sympathetic to your argument/conclusions
- One shot process
 - May get to respond to reviewers comments, but usually NO opportunity to revise and resubmit

Implications?

- Need to focus on what your research will achieve and why it is important
- Need to write at two levels
 - Big picture for the non-expert
 - Knowledge of literature and methodological sophistication for the (more) expert reviewer
- Need a very clear big-picture story from the beginning
 - Front-load your proposal and structure your proposal around this big-picture story
- Need feedback about whether your big-picture story works
 - Get feedback early (i.e. Does the big-picture story work? NOT do you have any suggestions about how to fine tune a completed case)

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FREQUENT PROBLEMS

Most common mistakes

- Excellent science – poor consortium, implementation, impact
- Proposal does not address text of call
- General or vague idea
- It appears as if proposal written by people who have never met
- Proposal not edited or poor proof-reading
- Unclear relationship between work packages – what are the overall goals?
- Budget unclear, number of partners inappropriate

Own impressions

- Success rates low – as is readiness to contribute
- (too) much discussion around research; other important aspects often neglected
- Think carefully about *impact* and *implementation*
- Study call text carefully !
- Start early!

Recommendations

- Do not recycle old proposals, but learn from them
- Think about scientific and political dimension
- Establish all contacts early – last-minute proposals are doomed to fail (*most of the time*)
- Use our existing track record - *‘money attracts money’*
- Check layout carefully, avoid typos, highlight elements, etc!

GOOD LUCK WITH YOUR GRANT APPLICATIONS!

Carsten P Welsch

