



How to write a convincing ERC proposal (and how the ERC works)

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DARK  **LIGHT**

Outline

- How does the European Research Council work
 - Why the ERC
 - StG, CoG, AdG
 - The ERC areas and the Panels
- Writing a convincing, hopefully successful proposal:
 - Does it make sense to try? When is the right time?
 - How is the proposal composed? How should the various parts be written?
 - The PI: why you?
 - The project: why now?
 - Why an ERC grant for your scope?
 - ...

My background in this context

- ERC Advanced Grant holder 2012-2017 (“Darklight”, 1.72 Meuro)
- ERC CoG 2013 PE9 panel member
- ERC StG 2015, 2017, 2019 PE9 panel Chairman
- ERC external evaluator

What is the ERC

“The ERC's mission is to encourage the highest quality research in Europe through competitive funding and to support investigator-driven frontier research across all fields, on the basis of scientific excellence”

What is the ERC (1)

- Created in 2007 to complement existing European Union research funding schemes, focusing on individuals
- ‘Bottom-up’ in nature: identify new directions in any field of research, rather than being led by politics-driven priorities: channel funds into new and promising areas of research
- Open competition of projects headed by starting and established researchers
- Sole criterion is scientific excellence: recognise the best ideas, and confer status and visibility on the best brains in Europe, while also attracting talent from abroad

The ERC sectors and panels

1. Social Sciences and Humanities
 - 6 panels
2. Physical Sciences and Engineering
 - 9 panels
 - PE9: Universe Sciences
3. Life Sciences
 - 9 panels

ERC: 3 main funding schemes

- Starting Grant
 - 2 to 7 years from PhD*
- Consolidator Grant
 - 8 to 12 years from PhD*
- Advanced Grant
 - Established scientists
- (Extra “Proof of Concept” scheme)
 - Small funding (150 Keuro max) for existing ERC projects, to bring their results to market

* Career breaks (e.g. maternity leaves) are accounted for

What is the ERC (2)

WORLD CHAMPIONS IN R&D SPENDING AS % OF GDP

1. Israel	4.3%
2. South Korea	4.3%
3. Japan	3.4%
4. Finland	3.2%
5. Austria	3.1%

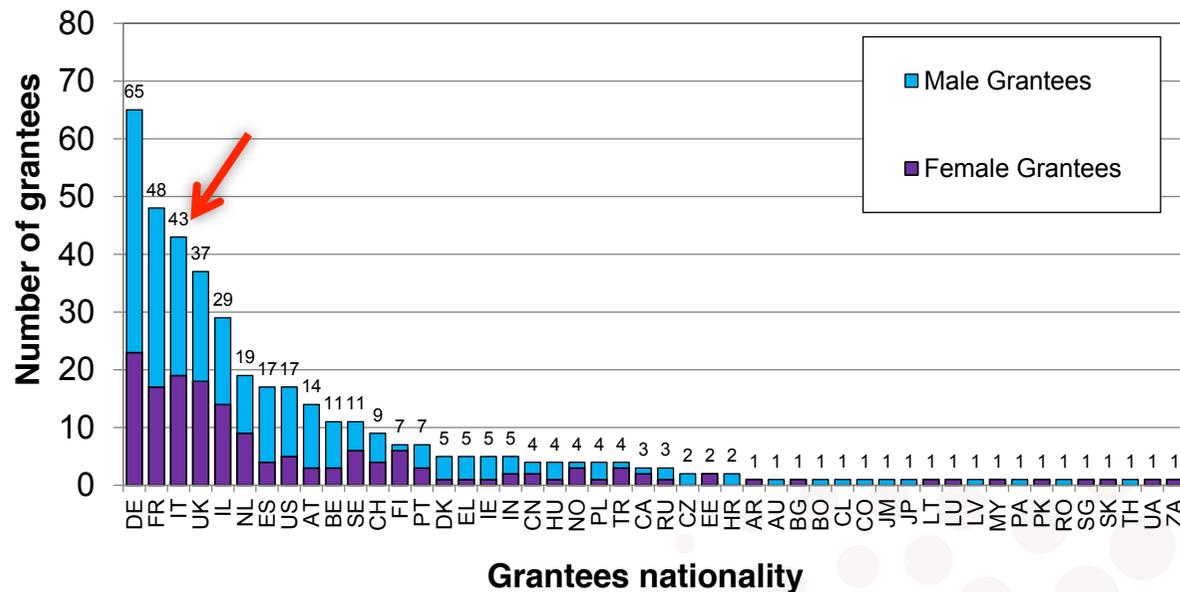
- Longer term aim of the ERC goes beyond simple research funding
- Grants are awarded to a Host Institution, which is explicitly committed to provide the PI with appropriate conditions as to independently direct their research and manage its funding
- These procedures strengthen and shape the European research system, establishing high-level standards by:
 - High quality peer review
 - Setting international benchmarks of efficiency and success
 - Encouraging universities and research institutions to gauge their performance and confront with best standards (e.g. running an ERC grant exposes bottlenecks in research systems, thus fostering better practices)
- In the longer term, this will make Europe's average research standards stronger and more homogeneous

Evidencing the differences of research systems: strength of the PIs

ERC Starting Grant 2017
Grantees by nationality and gender
Total 406 grants



48 nationalities

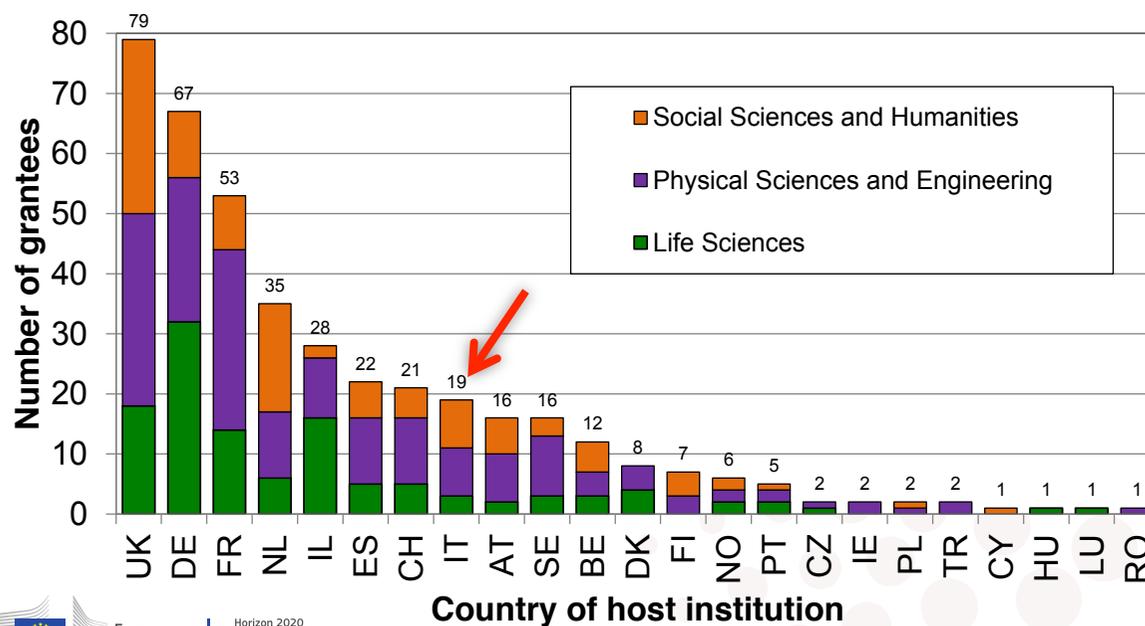


Evidencing the differences of research systems: strength of the countries

ERC Starting Grants 2017
Grantees by Country of Host Institution & domain
Total 406 grants

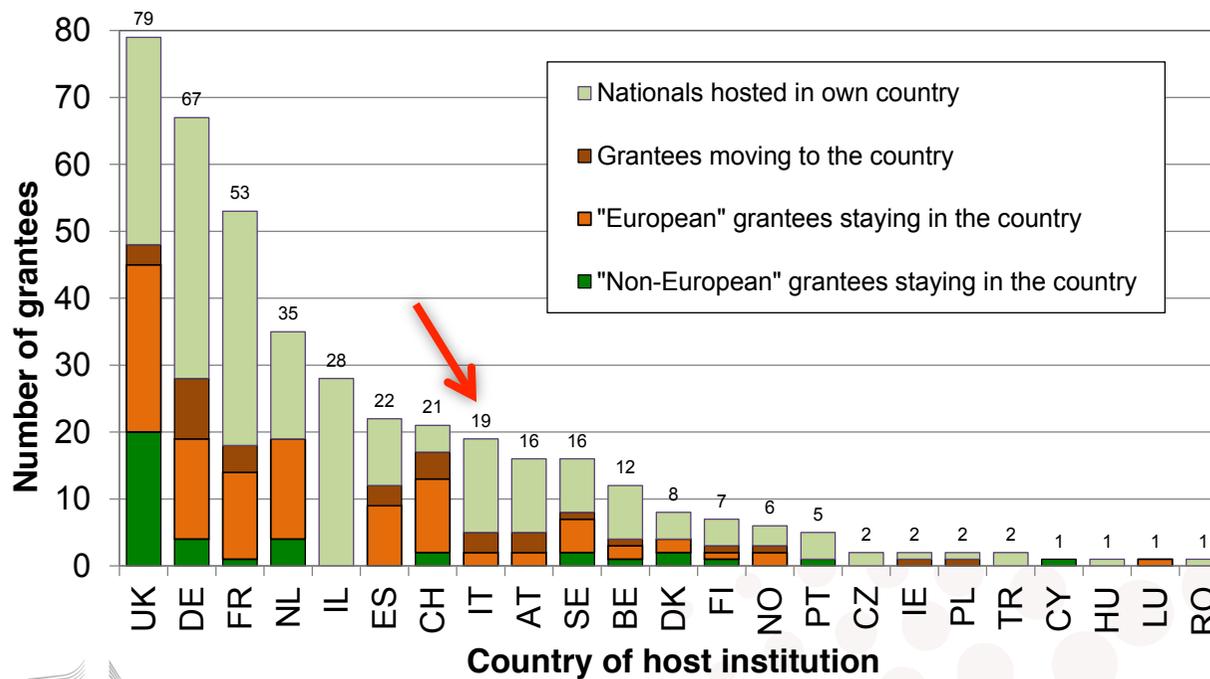


23 countries



Evidencing the differences of research systems (StG 2017)

ERC Starting Grant 2017
Mobility: Incoming and staying grantees
 Total 406 grants



Applying for an ERC grant



How many chances do I stand?

ERC Starting Grant 2017
Submitted and selected proposals by domain



European Research Council
Established by the European Commission

	Submitted Proposals	Selected Proposals
Life Sciences	874	118
Physical Sciences and Engineering	1339	177
Social Sciences and Humanities	872	111
Total	3085	406

Success rate ~ 13 %

Boundary conditions

- Implications are slightly different if you are applying for a StG, CoG or AdG. I will take from now on the point of view of a young scientist, so think of a StG or CoG
- The ERC name of the game is EXCELLENCE: your research must have had an impact, proportionally to your career level. See examples of CoG:
<https://erc.europa.eu/news/erc-consolidator-grants-2017-project-examples>
- But don't be too hard on you, especially if you are applying for a StG. You are often better than you think! Be realistic
- The panel needs to be convinced that you are capable of delivering original, interesting work
- And that you now desperately need this grant to make the next step!
- For CoG and AdG in particular, a recent breakthrough is the ideal starting point for a strong proposal

A strong record is not enough, though...



You need an equally strong project, presented by
a crystal clear proposal ...

The structure of an ERC proposal

- A. Financial and administrative forms (Part A)
- B. Scientific proposal:
 - **B1 (PI scientific profile and CV + extended synopsis)**
 - only read by panel members (4 for StG): typically only 1-2 can be expert or close to the specific sub-area of the proposal. This part needs to be written accordingly. Also, anticipate your budget and management structure in broad terms.
 - **B2 (full proposal, w budget justification)**
 - only seen if you pass to Step 2
 - evaluated by external expert referees (at least 2, typically 4, sometimes more) plus 4 panel members.
 - Obviously, experts have stronger weight, interview crucial to verify referee's doubts.
 - Final decisions are taken after thorough discussion, not by simple maths!
- All parts to be submitted together by the deadline

Getting started (1)

- Start early → this is not a “normal” proposal, start drafting your idea at least 3 months before the deadline, ideally even 6 or more (Darklight example)
- Go to the ERC website (<https://erc.europa.eu/>) and get familiar; register on the Evaluation System
- Download and read well all important ERC documents:
 - Work Programme
 - Guide for Applicants
 - Guide for Peer Reviewers
- Once you have decided to try, contact the central offices of your institution handling these proposals: they have to get involved and will also help you to make a better proposal (e.g. INAF International Affairs Office)

Getting started (2)

- Imagine you are applying for your dream job. A company receives hundreds of applications and need to choose the best candidate in a very short time frame
- It is the same with ERC proposals
- Example: PE9 StG panel gets ~100 proposals for Step 1
- About 20-25 are passed to Step 2 (interview*)
- All of these are excellent proposals! Only about 10 are selected for funding

- 1) Your proposal must make a difference, to pass Step 1
- 2) The slightest details matter, to get funded

*(AdG has no interview)

The panel: PE9 - Universe Sciences

PE9 Universe Sciences: Astro-physics/chemistry/biology; solar system; stellar, galactic and extragalactic astronomy, planetary systems, cosmology, space science, instrumentation

PE9_1 Solar and interplanetary physics

PE9_2 Planetary systems sciences

PE9_3 Interstellar medium

PE9_4 Formation of stars and planets

PE9_5 Astrobiology

PE9_6 Stars and stellar systems

PE9_7 The Galaxy

PE9_8 Formation and evolution of galaxies

PE9_9 Clusters of galaxies and large scale structures

PE9_10 High energy and particles astronomy – X-rays, cosmic rays, gamma rays, neutrinos

PE9_11 Relativistic astrophysics

PE9_12 Dark matter, dark energy

PE9_13 Gravitational astronomy

PE9_14 Cosmology

PE9_15 Space Sciences

PE9_16 Very large data bases: archiving, handling and analysis

PE9_17 Instrumentation - telescopes, detectors and techniques

How ERC evaluators read the proposal

- They first read title and abstract
- This already sets the scene and affects their interest in reading more
- They then get a first idea of the PI strength, looking at the CV and publication list
- They often flip through the pages, looking at figures and captions to get a first idea of the story: structure of the proposal is important!
Crucial parts should be eye catching
- This often produces 3 piles: In; Intermediate; Out. A second pass on the Intermediate pile defines the final lot.

- Evaluators (panel members in particular) have many proposals to read and little time: a nice proposal eases their work
- Part B1 will also be seen by non-specialists: you need to fascinate them with broad arguments. They need to see the beauty and uniqueness of your idea, beyond technicalities

How ERC evaluation works

- **Important:**
 - Nationality, gender, age, host institution, amount of the requested grant **ARE NOT APPLICABLE CRITERIA**. Only your profile and your project matter.
 - ERC deserves a lot of attention on spotting **CONFLICTS OF INTEREST**, which are treated very strictly

Your proposal – B1: the P.I. (1)

- Section A. Scientific Leadership Profile
 - This is like cover letter of a job application. Together with the CV and the track record describe your career in two complementary ways
 - Describe your main research achievements: what is most relevant? What are you known for?
 - Document your achievements - it is not enough to say “I have participated in many international projects“. Say which ones and which was your role
 - Come to the point. Be precise. “I established / I identified / I demonstrated / I initiated / I was awarded ...”
 - Provide esteem indicators, as bibliometrics (citations, indexes) to quantify the impact of your work. This is important for all schemes: StG, CoG, AdG.

Your proposal – B1: the P.I (2)

- Section B. the Curriculum Vitae
 - Which sub-headers are best to describe yourself and your achievements? E.g.:
 - Education
 - Scientific experience
 - Teaching and supervision
 - Awards
 - Key publications
 - Invited talks
 - Focus your CV where you are strong. Competition is high: evaluators should see you excellence at once. Sell yourself, without bluffing (over-selling does as bad as under-selling)

Your proposal– B2: the proposal (1)

- *The ERC funds basic research projects that are novel, creative, go significantly beyond the state of the art, make substantial advances in the frontiers of knowledge, use new methods and techniques, are interdisciplinary, and high- risk-high-gain projects*
- This means the proposal must be short, concise and crystal clear:
 - Focus on the above concepts
 - Display them clearly and in a user-friendly manner
 - Show where and why your project is excellent

Your proposal – B2: the proposal (2)

- Figures, graphs and tables are crucial to this end
- In B2 show project timeline with Gantt-like diagram, marking milestones
- Abstract and title (B1) are important
 - Choose a short and clear title
 - Choose a short and catchy acronym
 - Write a sharp and concise abstract
- The ERC funds projects that cannot be funded otherwise
 - Why you need the ERC grant?
 - Why it is now the best moment?
- Your project must make a difference

Darklight example...

Guzzo

Part B1

DARKLIGHT

European Research Council

ERC Advanced Grant 2011 Research proposal (Part B1)

Illuminating Dark Energy with the Next Generation of Cosmological Redshift Surveys

DARKLIGHT

- Principal Investigator: **Luigi Guzzo**
- Hosting Institution: **INAF – Osservatorio di Brera**
- Project duration: **60 months**

Galaxy redshift surveys have been central in establishing the current successful cosmological model. Reconstructing the large-scale distribution of galaxies in space and time, they provide us with a unique probe of the basic constituents of the Universe, their evolution and the background fundamental physics. A new generation of even larger surveys is planned for the starting decade, with the aim of solving the remaining mysteries of the standard model using high-precision measurements of galaxy clustering. These entail the nature of the “dark sector” and in particular the origin of the accelerated cosmic expansion. While data accumulation already started, the needed analysis capabilities to reach the required percent levels in both accuracy and precision are not ready yet.

I propose to establish a focused research group to develop these capabilities and optimally analyze the new data. New techniques as redshift-space distortions and well-known but still debated probes as galaxy clusters will be refined to a new level. They will be combined with more established methods as baryonic acoustic oscillations and with external data as CMB anisotropies. Performances will be validated on mock samples from large numerical simulations and then applied to state-of-the-art data with enhanced control over systematic errors to obtain the best achievable measurements.

These new, coherently developed capabilities will be decisive in enabling ongoing and future surveys to address and solve the key open problems in cosmology: What is the nature of dark energy? Is it produced by an evolving scalar field? Or does it rather require a modification of the laws of gravity? How does it relate to dark matter? The answer to these questions may well revolutionize our view of physics.

Your proposal – B2: the proposal (3)

- Budget your resources carefully
- Why you need personnel? Complementary? Supplementary?
- Why you need infrastructure (if any)?
- A small budget is not an advantage per se. It has to be justified, whatever it is.

Your proposal – Cosmetics and finish

- Evaluators have to look at a lot of proposals. They should get the message from your proposal very quickly
- This means the proposal must also look nice and tidy, easy to browse (e.g. figures should be eye-catching and explanatory):
 - Clear structure, logical flow, red thread
 - Your story, i.e. idea, goal, method should be visible at once
- This is achieved in practice through
 - Subdivision of your text: sub-headers, paragraphs...
 - Bulleting, numbering...
 - Clear hierarchy of titles and sections
 - Graphs, tables...
- Such aspects make your text “light” and easier to read

Your proposal – Cosmetics and finish

- One evaluator once said:

“An applicant who does not take his time to write a clear and nice proposal delegates the work to the evaluator, because the evaluator then has to struggle through the proposal to find the essence. The more the applicant can save the time of the evaluator, the better is their chance. An evaluator never has enough time”

- And another one:

“In the top 15% everybody deserves the grant. If a person is in the top 15%, a nice proposal can make the difference”

Resources

- ERC web site: <https://erc.europa.eu/>
- Step by step to ERC grants (movie):
<https://vimeo.com/117398570>
- ERC grant schemes (brochure):
https://erc.europa.eu/sites/default/files/document/file/ERC_Grant_Schemes.PDF