



**European Research Council**

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# ERC Starting Grant 2015

## *Inside the CV*

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Roma 13/11/2014



**Scientific excellence** is the sole criterion on the basis of which ERC frontier research grants are awarded.



The subject of the evaluation is the pair  
**Principal Investigator – Research Project**





# Principal Investigator



# Starting Grant Profile/1



A competitive **Starting Grant** candidate must have already shown the potential for research independence and evidence of maturity.

For example, it is expected that applicants will have produced at least one **important** publication without the participation of their PhD supervisor.



# Starting Grant Profile/2

Principal Investigators should also be able to demonstrate a promising **track record of early achievements** appropriate to their research field and career stage, including significant publications (as main author) in major international peer-reviewed multidisciplinary scientific journals, or in the leading international peer-reviewed journals of their respective field. They may also demonstrate a record of invited presentations in well-established international conferences, granted patents, awards, prizes etc.



# Early achievements track record



In the Track record the applicant PI should list:

1. **Up to five publications** in major international peer-reviewed multi-disciplinary scientific journals and/or in the leading international peer-reviewed journals, peer-reviewed conferences proceedings and/or monographs of their respective research fields, highlighting those without the presence as co-author of their PhD supervisor, and the number of citations (excluding self-citations) they have attracted (if applicable);
2. **Research monographs and any translations thereof** (if applicable);
3. **Granted patent(s)** (if applicable);
4. **Invited presentations to peer-reviewed, internationally established conferences and/or international advanced schools** (if applicable);
5. **Prizes/ Awards/ Academy memberships** (if applicable).



# Evaluation criteria CV



## 2. Principal Investigator

Intellectual capacity, creativity and commitment

### *Starting and Consolidator*

#### *Intellectual capacity and creativity*

*To what extent has the PI demonstrated the ability to propose and conduct ground-breaking research?*

*To what extent does the PI provide evidence of creative independent thinking?*

*To what extent have the achievements of the PI typically gone beyond the state of the art?*

#### **Commitment**

*To what extent does the PI demonstrate the level of commitment to the project necessary for its execution and the willingness to devote a significant amount of time to the project (min 50% for Starting and 40% for Consolidator of the total working time on it and min 50% in an EU Member State or Associated Country) (based on the full Scientific Proposal)?*

Step 1



# Evaluation sheet: CV



<b>Principal Investigator</b>	
To what extent has the PI demonstrated the ability to propose and conduct ground-breaking research?	
To what extent does the PI provide evidence of creative independent thinking?	
To what extent have the achievements of the PI typically gone beyond the state of the art?	

Possible Scores for each criterion:

Outstanding; Excellent; Very good; Non-competitive

<b>Comments (Optional for reviewers)</b>



# ERC Grantees in FP7

(2007-2013)



# CV Analysis



## CV analysis:

- Publications without the PhD Supervisor VS Total number of publications
- International Mobility
- Examples of Prizes and Awards

*\*\* Data collected for 20 ERC winners in PE2 (call from 2007 to 2013) from CV available on the web*





# Publications



# 2013 – StG – PE2 ERC winners

PI	Country	HI	Publ. without the PhD Superv./Publ. tot
Rene Gerritsma	Germany	University of Mainz	18/25
Henning Moritz	Germany	University of Hamburg	4/27
Paola Cappellaro	Italy	European Laboratory of non-linear Spectroscopy	33/52
Piotr Sulkowski	Poland	University of Warsaw	27/30
Marco Vignati	Italy	Sapienza Università di Roma	15/26

For this sample, on average the percentage of publications without the PhD Supervisor is **59,6 %**



# 2012 – StG – PE2 ERC winners

PI	Country	HI	Publ. without the PhD Superv./Publ. tot
<b>Thomas P. Sotiriou</b>	Italy	SISSA	48/59
<b>Guido Pupillo</b>	France	Centre International de Recherche aux Frontieres...	33/41
<b>Joseph Conlon</b>	England	The Chancellor, masters and scholars of the University of Oxford	16/31
<b>Stefan Hild</b>	Scotland	University of Glasgow	140/147
<b>Jeffrey Hartnell</b>	England	University of Sussex	28/31

*For this sample, on average the percentage of publications without the PhD Supervisor is **79,8 %***



# 2011/2010 – StG – PE2 ERC winners

Call year	PI	Country	HI	Publ. without the PhD Superv./ Publ. tot
2011	<b>Henrich Markus T.</b>	Austria	Universitaet Innsbruck	21/29
2011	<b>Bertone Gianfranco</b>	The Netherlands	Universiteit Van Amsterdam	38/46
2011	<b>Gigan Sylvain Hervé</b>	France	CNRS	17/26
2010	<b>Kellerbauer Alban</b>	Germany	Max Planck Gesellschaft zur Foerderung der Wissenschaften	27/82
2010	<b>Goulielmakis Eleftherios</b>	Germany	Max Planck Gesellschaft zur Foerderung der Wissenschaften	10/32

*For this sample, on average the percentage of publications without the PhD Supervisor is **56,9%***



# 2009/2007 – StG – PE2 ERC winners

Call Year	PI	Country	HI	Publ. without the PhD Superv./ Publ. tot
2009	<b>Irastorza Igor Garcia</b>	Spain	Universidad de Zaragoza	21/68
2009	<b>Aspelmeyer Markus</b>	Austria	Universitaet Wien	38/42
2009	<b>Treps Nicolas</b>	France	Universite Pierre Et Marie Curie - Paris 6	13/57
2007	<b>Katz Sandor</b>	Hungary	Eotvos Lorand Tudomanyegyetem	3/36
2007	<b>Livia Conti</b>	Italy	INFN	16/30

For this sample, on average the percentage of publications without the PhD Supervisor is **41,2%**



# Publications without the PhD Supervisor: a comparison



## Some Remarks:

- No researchers with **zero publications** without the PhD Supervisor
- Considering the CVs investigated on average the publications without the PhD Supervisor are **59,4%**
- More than half of researchers have **more than 20 publications** without their PhD supervisor

N° of publ. without PhD Supervisor	N° of researchers
0	0/20
1 to 20	8/20
> 20	12/20







# Mobility



# Mobility

2013 StG –  
PE2 ERC /  
1

PI/Phd Inst.	How long	Where	Why
<b>Rene Gerritsma/</b> Un. of Amsterdam	2007-2001	Institut für Quantenoptik und Quanteninformation, Innsbruck	Postdoc
	2011-present	Institut für Physik, Johannes Gutenberg University Mainz	Postdoc
<b>Henning Moritz/ETH</b> Zurich	Since 2010	University of Hamburg	Professor
	2006-2010	ETH Zürich	Postdoc
	2001-2005	ETH Zürich	PhD Student
	1997-1998	University of Cambridge	Rotary Scholar
<b>Paola Cappellaro/</b> MIT	2009-present	Massachusetts Institute of Technology	Associate Professor/ Head of the Quantum Engineering Group
	2006-2009	ITAMP (Harvard University)	Postdoc
	2001-2006	Massachusetts Institute of Technology	PhD Student
	1997-2000	Ecole Centrale Paris	Joint MS in Applied Physics with Politecnico di Milano



# Mobility

2013 StG –  
PE2 ERC/2

PI/Phd Inst	How long	Where	Why
<b>Piotr Sulkowski/</b> University of Warsaw	2012-2013	University of Amsterdam	Postdoc
	2009-2012	California Institute of Technology	Postdoc/Visiting faculty/ associate in High Energy Theory Group
	2009	Harvard University/University of California San Diego	Postdoc/Visiting researcher
	2007/2009	University of Bonn and Bethe Center for Theoretical Physics	Postdoc
	2004/2007	University of Amsterdam	Visiting PhD Student
	2001	University of Duham	Postgraduate Student
<b>Marco Vignati/</b> Sapienza	2003	Stanford Linear Accelerator center	Visiting Student



# Mobility

2012 StG –  
PE2 ERC

PI/Phd Inst	How long	Where	Why
<b>Thomas P. Sotiriou/</b> SISSA	2011-present	SISSA, Trieste	Assistant Professor
	2007-2011	Un. of Maryland/ DAMTP, Un. of Cambridge	Postdoc/Marie Curie Fellow
	2004-2007	SISSA, Trieste	PhD Student
<b>Guido Pupillo/</b> Univ. Of Maryland	2005-2011	Academy of science – Austria	Senior Scientist
	2001-2005	University of Maryland - NIST	PhD Student
<b>Joseph Conlon /</b> Cambridge University	-	-	-
<b>Stefan Hild /</b> Un. of Hannover	2009 – present	School of Physics and Astronomy, Un. of Glasgow	Lecturer
	-	School of Physics and Astronomy, Un. of Birmingham	Research Fellow
<b>Jeffrey Hartnell/</b> Oxford Un.	-	-	-



# Mobility

2011/2010  
StG – PE2  
ERC

PI	How long	Where	Why
<b>Hennrich Markus T.</b> / TU Munchen	2007- present	Innsbruck University	Assistant and then Associate Professor
	2004-2007	EIF at ICFO	Post doc researcher and Marie Curie Fellow
<b>Bertone Gianfranco/</b> Oxford Un.	<i>See as an example of a possible Italian CV (next slide)</i>		
<b>Gigan Sylvain Hervé/</b> Université Pierre et Marie Curie	2004-2007	University of Vienna	Researcher - Zeilinger
<b>Kellerbauer Alban/</b> Un. Of Heidelberg	2003-2005	CERN	CERN fellow + scholarships
<b>Goulielmakis Eleftherios/</b> University of Munich	2010-present	Max Plank Center of Attosecond Science	Coordinator
	2010-present	Pohang Institute of Technology, Korea	Adjunt Prof Physics
	2005-2010	Max plank institute of Q.P.	Team leader/postdoctoral Researcher
	2002-2005	Technical University of Vienna & Physics Department University of Munich	PhD student



# Mobility

(Gianfranco Bertone)



How long	Where	Why
2009-2011	Institute for Theoretical Physics, U. of Zurich	Visiting Professor
2006 -present	CNRS	Permanent Researcher/ Coordinator of the Theoretical Physics group
2003-2005	Particle Astrophysics Center, Fermilab, Chicago	Research Associate, Theoretical Astrophysics group Associate Fellow
2000-2003	Institut d'Astrophysique de Paris	PhD Student
2000-2001	University of Oxford	Marie Curie fellow/PhD Student
1999-2000	Observatoire de Paris - Meudon	Master (DEA) in Theoretical Astrophysics and Cosmology



# Mobility

2009/2007  
StG – PE2  
ERC

PI	How long	Where	Why
<b>Irastorza Igor Garcia/</b> Universidad de Zaragoza	2007-present	Cambridge	Reader, Fellow and Senior Lecturer and then Professor
	2001-2004	CERN	Research Fellow
<b>Aspelmeyer Markus/</b> University of Munich	2004-2006	CEA/Saclay [...]	Post Doctoral Researcher & Many other experiences
<b>Treps Nicolas/</b> Université Pierre et Marie Curie	2001-2002	National University Canberra	Post doc
<b>Katz Sandor/</b> Eotvos University	2001-2003	Desy - Hamburg	Post doc
	2003-2005	Uni Wuppertal	Post doc
<b>Livia Conti/</b> Univ of Trento	2000 - 2 months	Institute for cosmic ray research of the University of Tokyo	-



# Mobility

2009/2007  
StG – PE2  
ERC

PI	How long	Where	Why
<b>Irastorza Igor Garcia/</b> Universidad de Zaragoza	2007-2013	Cambridge	Reader, Fellow and Senior Lecturer and then Professor
	2001-2004	CERN	Research Fellow
<b>Aspelmeyer Markus/</b> University of Munich	2004-2006	CEA/Saclay [...]	Post Doctoral Researcher & Many other experiences
<b>Treps Nicolas/</b> Université Pierre et Marie Curie	2001-2002	National University Canberra	Post doc
<b>Katz Sandor/</b> Eotvos University	2001-2003	Desy - Hamburg	Post doc
	2003-2005	Uni Wuppertal	Post doc
<b>Livia Conti/</b> Univ of Trento	2000 - 2 months	Institute for cosmic ray research of the University of Tokyo	-





# Mobility: some remarks



- 18/19\* PIs have at least one important international experience
- In 2 cases where there are few experiences abroad, this is offset by the mobility within the country of origin or by a huge participation in international events
- The minimum stay (1 case) is 2 months
- Experiences are mainly long periods (more than one year)

*\*in one case information was not available*



# StG – PE2 ERC winners

## Ex.of Awards/Grants

- Marie Curie Grant
- European Physical Society
- European Young Investigator award
- European Contest for Young Scientist
- ANR Chair d'Excellence
- AFOSR Young Investigator Award
- Humboldt Foundation
- FIRB
- Rita Levi Montalcini
- SIF
- SIGRAV prize of the Italian society of General relativity and Gravitation



# Positive evaluations of CV/1

- Several publications are single authored showing research independence and creativity. Important **research mobility**, ex MC fellow
- The track record involves many publications in high end journals and the citations are very good and promising considering age of the applicant. Also the number of invited talks and supervision of students are above average and guarantee a **high degree of scientific independence of the application**
- **World leading expert in his field** with several important research achievements of wide impact in the community. He is a main player of his field.



# Positive evaluations of CV/2

- His achievements and publications are **truly ground-breaking**. Number of citations of his papers exceeds 2000 and his h-index is 27, which is truly impressive at the PI's career stage. The papers demonstrate **his independent and creative thinking and his capability to go significantly beyond the present state of the art**
- The PI is an exceptionally **innovative and active young scientist**, holding a permanent position at a leading university. The list of tasks with a **significant leading role** is long demonstrating the PI's ability to **lead scientific project in an international environment**. Also the list of presentations at international conferences, workshops and seminars proves the confidence he enjoys from collaborators
- The PI is an outstanding young scientist who already at a young age has made a strong impact evidenced by publishing a review in his field of research, and has become a very important reference in this field. He has publications in high impact journals and has achieved extremely high citations and a very high Hirsch index. He has strong international collaborations with the most important groups. **He has already established his independence through building a reasonable group of post-docs and PhD students under his supervision**. He has teaching experience through lecturing at the various departments and institutes where he spent extended periods. He has also contributed to public outreach. He has been (co-)organiser of several workshops and conferences and has been invited to give review talks at many international conferences.





# Project Proposal



# Evaluation criteria Project

## 1. Research Project

**Ground-breaking nature, ambition and feasibility**

**Starting, Consolidator and Advanced**

***Ground-breaking nature and potential impact of the research project***

*To what extent does the proposed research address important challenges?*

*To what extent are the objectives ambitious and beyond the state of the art (e.g. novel concepts and approaches or development across disciplines)?*

*To what extent is the proposed research high risk/high gain?*

***Scientific Approach***

*To what extent is the outlined scientific approach feasible bearing in mind the extent that the proposed research is high risk/high gain (based on the Extended Synopsis)?*

*To what extent is the proposed research methodology appropriate to achieve the goals of the project (based on the full Scientific Proposal)?*

*To what extent does the proposal involve the development of novel methodology (based on the full Scientific Proposal)?*

*To what extent are the proposed timescales and resources necessary and properly justified (based on the full Scientific Proposal)?*



Step 1



Step 1



Step 2

# Positive evaluations of project/1

- **Very well written and precise research project**, with several concrete subprojects; adequate methodology and appropriate team structure.
- The project is **very ambitious**. The proposed methodology is valid and the PI defines **a number of intermediate steps that need to be taken in order to achieve the principal ambitious objective**. In each of these steps tasks are defined with well-defined goals and approaches to achieve them in collaboration with internationally well-known groups. These collaborations are justifiable considering the high risk of the project. **The methodologies that will be used are novel with a high potential for groundbreaking discovery. The human resources are more than sufficient.**
- The proposal **capitalizes on recent original work of the PI**. The project, if successful, may have tremendous impact on a number of fields. The proposed methodology appears to be sound and innovative.



# Positive evaluations of project/2

- The presented project introduces a ***completely novel technique*** . The techniques are clearly on the forefront of the current state of the art and of ***relatively high risk, yet also with a potential high gain***. The various step described in the project are feasible, yet the overall outcome of the project is not guaranteed. The development proposed is novel to the domain and technically challenging. The methodology proposed is appropriate and the timescale and resources for such an ambitious project justified.
- This is a ***very interesting and feasible project***. I find the methodology very adequate. ***The detailed project is very structured*** and makes it a really excellent project, especially for a young researcher.
- The scientific approach is based on ideas of the applicants and appears entirely feasible. The methodology is suitable and given the applicant's work so far it is evident that she is in full command of the required techniques and methods. ***A new scientific methodology will be developed here. The time scale is reasonable. The resources are justified.***







# Horizon2020: first ERC StG Call (2014)





# Some figures

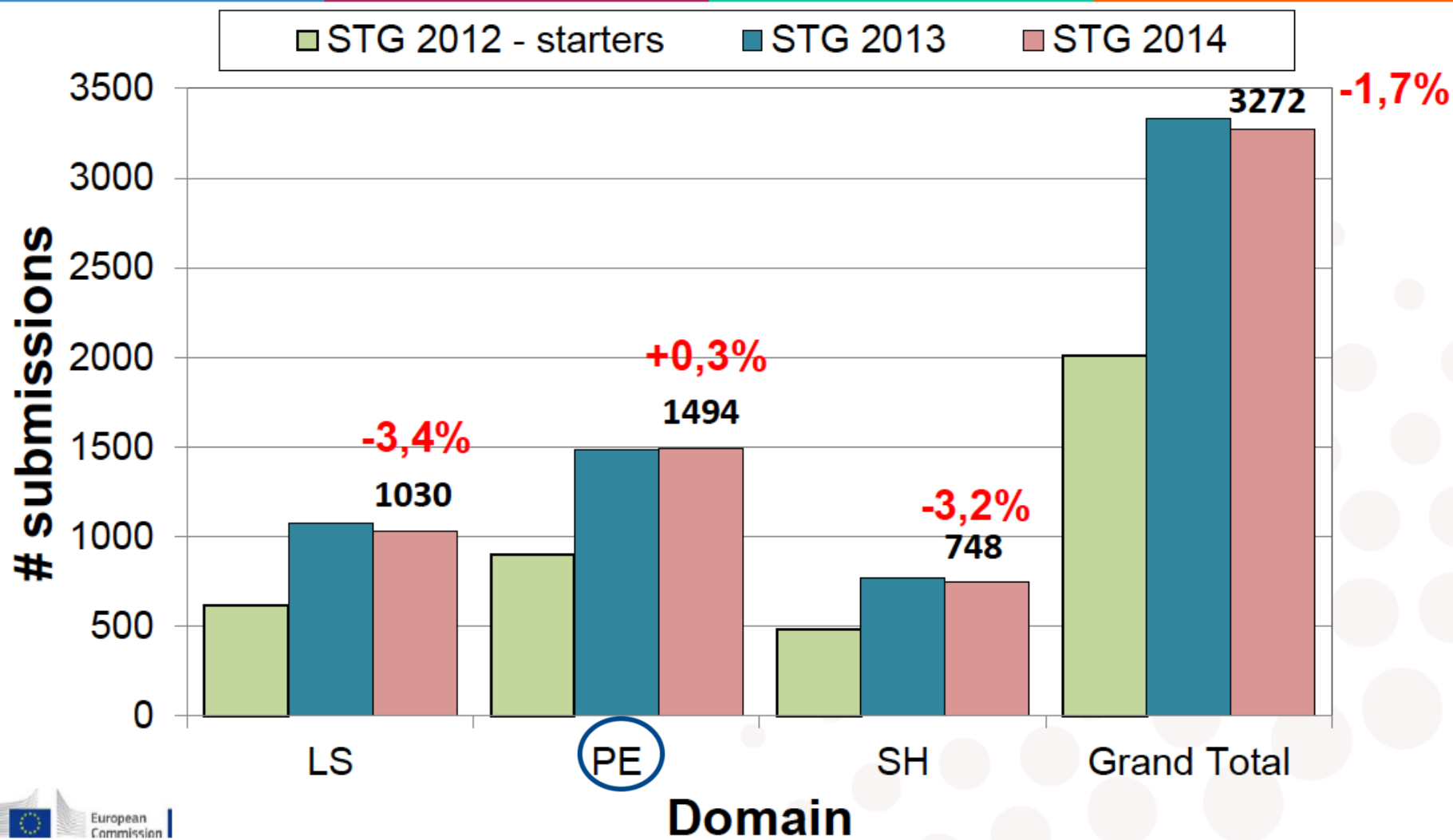


# Submission Data

## StG 2012-2014



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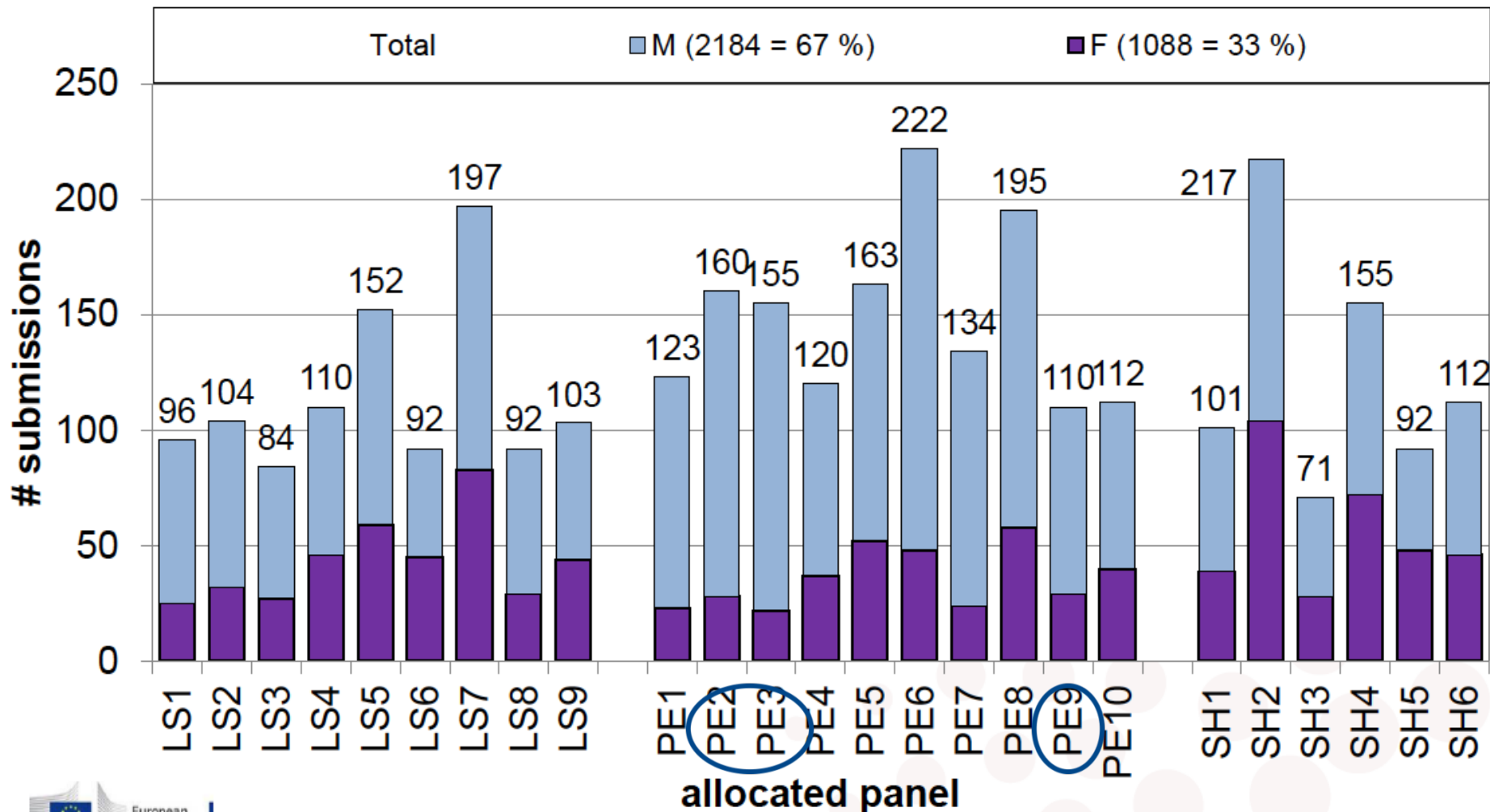
# Submission Data

## StG 2014 by panel and gender



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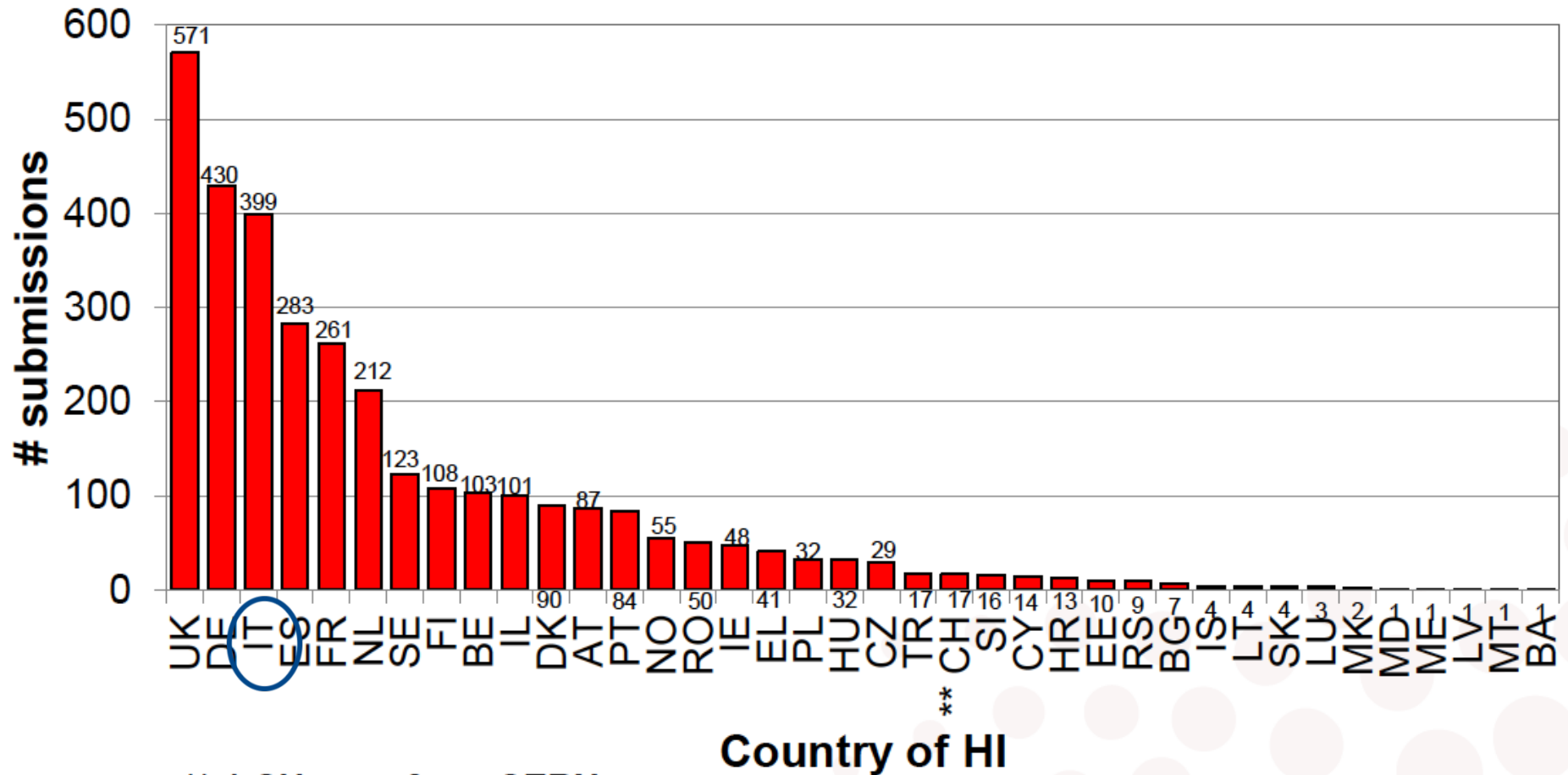


# Submission Data

## 39 HI countries



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\*\* 1 CH prop from CERN

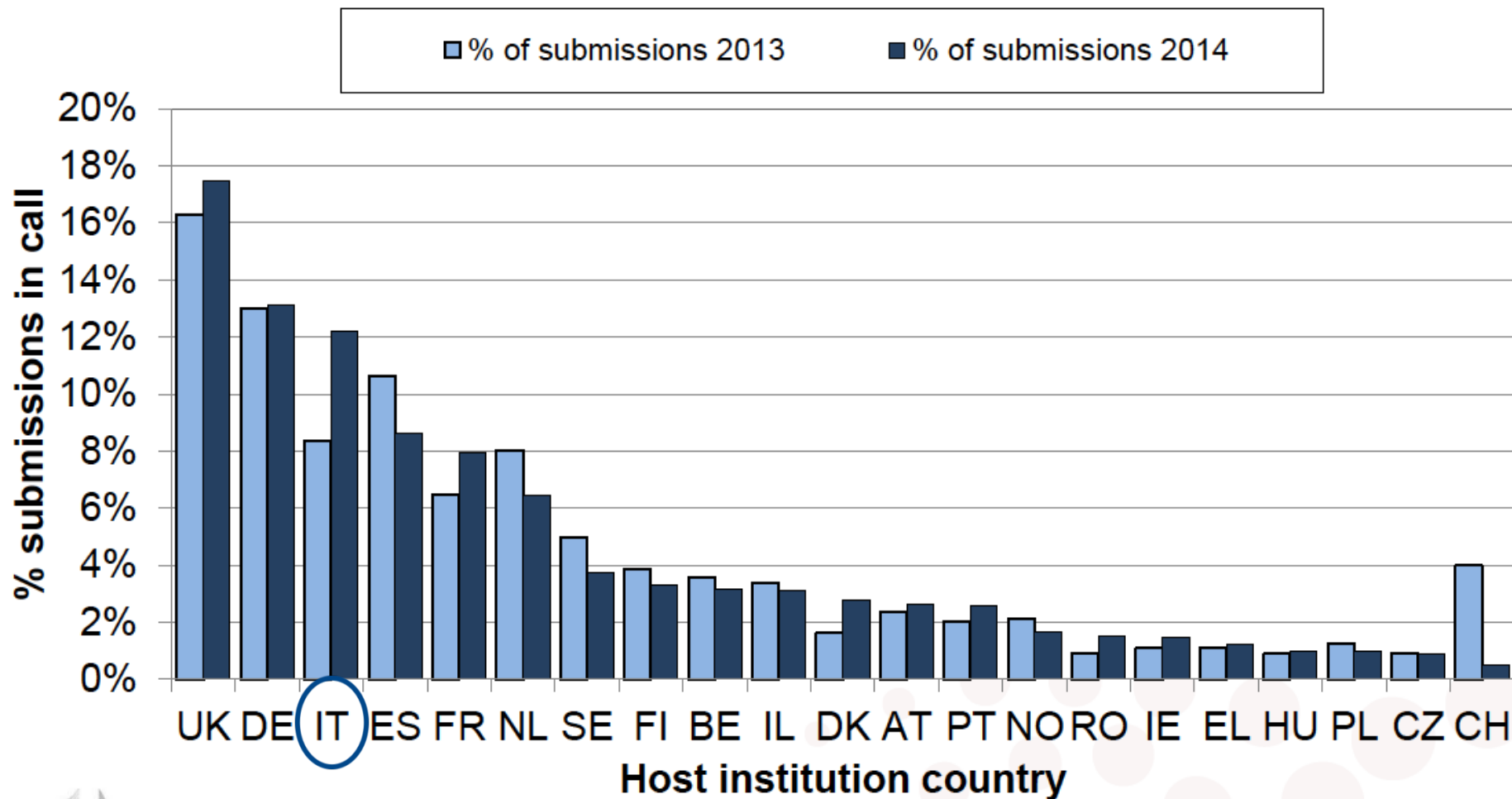
Country of HI

# Submission Data

## StG 2013-2014 HI country (top 21 )



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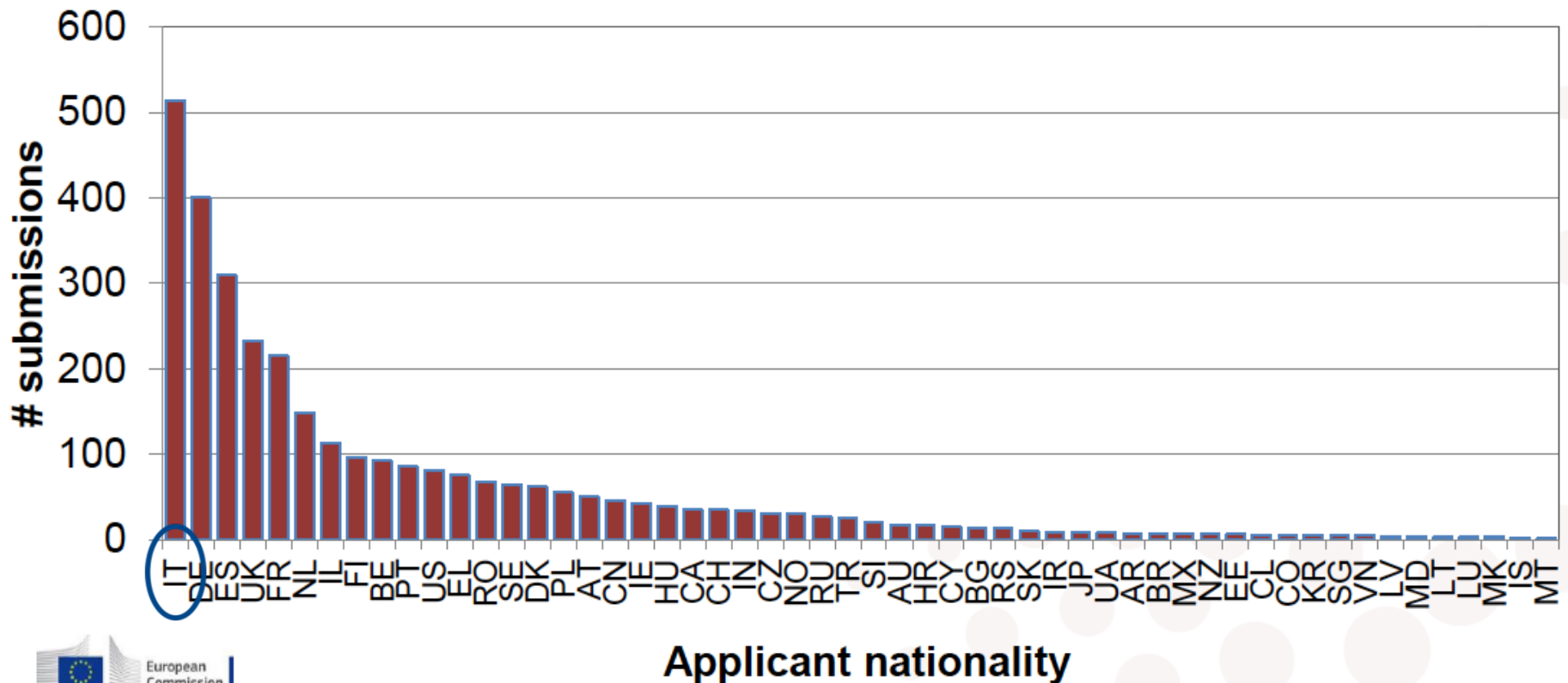
# Submission Data

## PI Nationality



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**ERC STG 2014 Submissions by applicant nationality (incl. all nationalities over 5 submissions and all MS or ass. countries)**

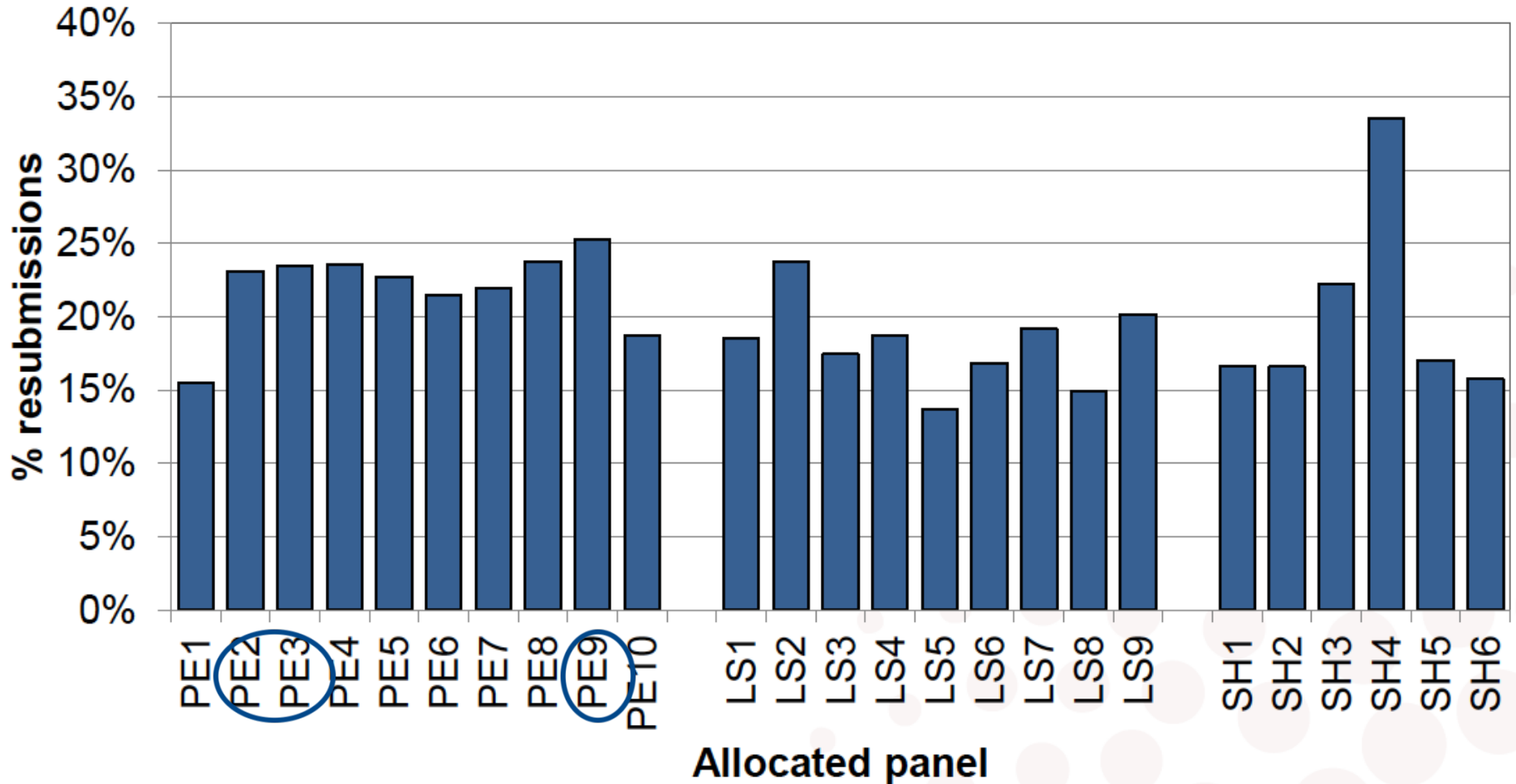


# ERC Calls – STG 2014

## Resubmissions by panel



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# ERC StG Call (2014): INFN Participation



# ERC-StG 2014: INFN/1

- Applicants: 18
- PE2: 14
- Other panels: 4 (PE3, PE9, LS7)
- Passed to Step2: 0
- Evaluation:
  - B: 9
  - C: 9



# ERC-StG 2014: INFN/2



## Main Weaknesses (CV):

- Few important publications without the PhD Supervisor
- Scarce international mobility
- Lack of personal funding
- Low experience in participation/management of international projects



# ERC-StG 2014: INFN/3

- Average publications without the PhD Supervisor
- Total proposals: 22,3%
  - Score B: 24,7%
  - Score C: 20%

Total proposals PE2 : **23,7%**



# Evaluations of CV (score B)

- It appears that the proposer has exclusively published with experimental consortia involving large (and alphabetic) author list. There is not a single research paper with would allow to access the ability of independent thinking to be clearly distinguished from the competence and expertise of the collaboration, a problem common to many applicants who work primarily or even exclusively under such circumstances. Yet, ***there are sufficient examples where collaborativework and individual competence develop on similar grounds, offering exceptional scientist to distinguish themselves.***
- The PI has a long list of publications in refereed journal ***but with a low level of citations.*** Good past performance with the appropriate expertise
- ***Very good*** scientist in his field. The PI is very active in teaching activities and in participating to collective outreach, and popularizing sciences, etc... The PI has shown independent thinking by publishing number of articles without his supervisor. He is already an expert that has had a lot of responsibility. He already has a scientific reputation as shown by the numerous grants he has obtained



# Evaluations of CV (score C)

- A **reasonably good** track record in the field of the proposal. The applicant was engaged in several collaborations, with very good results, and is the principal investigator of a project with a national funding. **The info on citations is incomplete; in addition, the role as an independent creative scientist is not fully demonstrated** in the proposal.
- The PI has nearly 100 publications, which is amazing. A lot of papers where he is the first author, many in the leading journals. The impact may not have the required level, but is still impressive. There are no doubts about ground breaking research; about independent thinking and the capability of going beyond the state of art. **One can still ask to which extend this is due to the PI, and to which due to the collaborators**
- The PI's track record is good, but is **not demonstrating scientific excellence**. Furthermore, **it is not clear, if the PI has contributed and developed his own original and new ideas in any of the listed projects, in which he is listed as team member**



# Evaluations of project (score B)

- The proposal is focused on a very hot topic. ***The duration*** of 36 months seems to be a little bit short to address the whole work described.
- The proposed project does address an important challenge. ***The objectives are ambitious, but limited. It is not clear if this limits a high gain.***
- It is a ***moderate risk research***, and the potential gain is moderate too.



# Evaluations of project (score C)



- All steps are well described and progressively build the needed knowledge. ***One could expect a better balanced description of the advantages/drawbacks of different solutions***
- The project ***appears to be an evolutionary step from previous work of the PI and others***, in that sense the project is low risk.
- It is a high risk project. The only criticism I may have is that this is ***a project requiring work of many, and it is not clear for me how critical and original will the contributions of the PI be.***





**Thanks for your attention!**

