
ERC AND CHINA: MEET THE PRESIDENT OF THE EUROPEAN RESEARCH COUNCIL

23 JUNE, BEIJING, CHINA



*In honour of the prestigious visit of **ERC President, Professor Jean-Pierre Bourguignon**, to Beijing, EURAXESS China organized a keynote lecture featuring the honourable French mathematician, which was hosted by the University of Chinese Academy of Sciences (UCAS) on Thursday, 23 June 2016.*

The European Research Council (ERC) is Europe's top agency funding frontier research. The lecture was organised for researchers interested in knowing more about ERC's prestigious grants and possibilities for Chinese and China-based researchers that are interested in either becoming grantees or members of ERC research teams.

In his presentation Prof Bourguignon introduced the history and the purpose of the ERC and the research programmes of the European Union, before and now. He presented the structure of the organization within the European Commission, and its relationship with it. He described the different grants available and the results so far with emphasis on the participation of Chinese researchers. He also went into the growing availability of non-European partnership schemes and

the new arrangement being offered jointly by the ERC and the National Science Foundation of China (NSFC). He finally went through the different ways non-European researchers can take part in ERC projects.



European Research Council

Established by the European Commission

WHAT IS THE EUROPEAN RESEARCH COUNCIL?

At the beginning of his talk, Prof Bourguignon started out with declaring his pleasure to be back in China, and Beijing especially; he has visited China many times since the 1980s and is excited to see the many new prospective collaboration opportunities. Before going into details, he began with introducing the European Research Council. Incorporating bottom-up research funding schemes into the European Union was a long struggle, because of its structure - the treaties that the Union is built on used to focus entirely on more economic aspects and bottom-up research was not part of it. The early framework programmes for research couldn't promote research for research's sake, instead they focused on what the treaties declared, such as wealth and job creation. It wasn't until 2007 with the Lisbon Treaty that the ERC was made possible.

The European Research Council was founded in the same year by the European Commission and it was **the first and only funding programme which only condition was the promotion of excellence science** within Europe. Because of this wide mandate, the limits of what kind of projects it funds are not very many; the only big restriction is that the funded projects have to be mainly hosted in the EU or countries associated to the EU's Framework Programme (so-called Associated Countries). The grants support individual researchers who can build up their projects independently. The funding is very competitive and therefore only about 10% of applicants were able to expect winning the grants.

The researchers and their prospective projects have to undergo an international peer review consisting of panels of the highest level of researchers in each field. The decision of what sort of projects are funded is **strictly made bottom up**. The researchers themselves have the initiative in designing what kind of research they want to do and the independent reviewers can use their own judgement to pick which projects are worth-while endeavours. Unlike many of the other top-down funding schemes in the EU, there are no themes or goals defined beforehand. They simply strain for excellent ground-breaking science. The ERC tries to attract high gain/high risk projects.

Even the governing structure underlines this; the ERC is governed by 22-member council of well-respected scientists. The European Commission, spearheaded by the European Commissioner for Science, Research and Innovation (since 2014, this is Carlos Moedas in the Commission of Jean-Claude Juncker), supervises the ERC alongside the Scientific Council. The day to day operations are in the hands of the ERC Executive Agency who puts the programmes together and monitors spending.

ERC STRUCTURE

The newest framework programme for research and innovation, Horizon 2020, started in 2014 and has 3 main pillars:

1. Excellent Science
2. Industrial Leadership
3. Societal Challenges.

The European Research Council falls under the first pillar, *Excellent Science*, alongside other programmes such as Marie Skłodowska-Curie Actions, Future and Emerging Technologies and Research Infrastructures. The budget of Horizon 2020 is divided evenly in 3 parts between the pillars.

In total the ERC gets now about 17% of Horizon 2020's budget. The budget has grown steadily throughout the years - in the **beginning of ERC, it was 300 million € but had grown to 1600 million € in 2014 where it has stayed for the last three years. Now the budget has started to grow again and is supposed to reach 2200 million € by 2020.**

In addition to the president, the ERC Scientific Council includes 3 vice-presidents, one for each domain of science; Life Science, Social Science and Engineering and Physical Sciences. The members of the Scientific Council are suggested by an independent committee.

The three types of grants given out by the European Research Council are ***Starting Grants***, which can not exceed 1.5 million € and are aimed at early career researchers that have gotten their PhD within the last 2-7 years, ***Consolidator Grants***, that are maximum 2 million € and for researchers that got their PhD in the last 7-12 years, and ***Advanced Grants***, which can go up to 2.5 million € and are for researchers that already have considerable track record. The time limits outlined here are a little more flexible for parents who have taken their parental leave; for example, a female researcher can stretch the time requirements by 18 months for every child she has had.

The grants give the receivers creative freedom and financial autonomy for 5 years. It offers them independence, recognition and visibility. The researchers themselves can also choose collaborators and teams to work with in any way they themselves see fit. They can themselves negotiate with host institutions for best conditions, 25% of the grant is marked for overhead. The grants are portable and if the researcher finds it necessary he or she can move the grant to any place in Europe. In practice very few move (3-4%) but it **brings the researcher a certain negotiation power**; usually if the researcher indicates seriously that they want to leave, the

institution tries to go further to accommodate it to make sure that doesn't happen. The grantees are **free to attract additional funding**; the grant helps with gaining recognition and further support.

There is no goals set in the way these grants are distributed, it's **completely bottom up**. There is no conditions for the research to have economic value but if the research results have potential to be moved to the market there are incentive of an extra 150 thousand € available through ERC Proof of Concept grants. Research turned start-ups are encouraged.

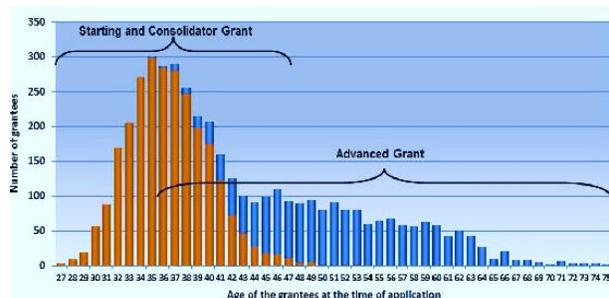
The evaluation panels are structured around three overarching fields; 9 of the panels are dedicated to the Life Sciences, 10 of the panels to the Physical Sciences and Engineering, and 6 of the panels are for Social Sciences. **The Physical Sciences and Engineering get around 45% of the budget, Life Sciences get 29% and Social Sciences and Humanities get 23%. That makes it the biggest funding scheme for Social Sciences and Humanities research in the world.**

ERC ACHIEVEMENTS

In the 9 years since the ERC was established, it has proven a big success story. It's highly recognized in the global scientific community for being some of the most prestigious funding programmes in the world. Since its establishment, the ERC has funded **more than 6000 top researchers**, thereof **65% still in their early career**. These researchers are of **67 different nationalities**, way beyond the number of countries in the European Union, and their projects have been hosted by more than 700 institutions in 32 European countries. **In total more than 10 billion € have been given out as grants**, with very small percentage going to overhead. When looking inside the teams around each project you find that there have been **around 40 thousand researchers that have worked for ERC funded project**.

Priority is given to younger researchers.

When looking at the grantees, we see that 2/3 of them are between 30 and 40 years old, while the age distribution is a bell curve with a long tail of advance grant holder of various ages. The ERC project teams create job for a lot of post-docs and PhD students, **30% of which are not European**. The results delivered by ERC are undeniable; in addition to the 6 grantees funded that already held a Noble Prize prior to obtaining the ERC grant **5 ERC grantees have won Noble price after being funded** (2 in 2010 and 2012 and 3 in 2014). **2 Field medals** (mathematics) have gone to ERC grantees after getting the grant.



The numbers from the beginning of the programme, although it has grown in size significantly since its creation in 2007, , were very promising: **21% of the first 200 funded projects turned out to be breakthrough research and 50% could be classified as major advances in sciences**. In general, **7% of publications resulting from ERC-funded research ends up in 1% of most cited** which is well above average and better than many prestigious grants in the US (where 2-5% are more common numbers). Even though there is no special encouragement for projects resulting in patents, 20% of projects report at least one patent. On average there are 2 patents per project.

Majority of team members on ERC funded projects, that is 71%, come from the European Union, and an additional 10% come from Associated Countries. 17% of team members, 7500 in total, come from countries outside of the European Research Area. **The most significant contributor there would be China, but it's number one with 18% of the total outside participation which would make approximately 1350 Chinese nationals who are or have been ERC team members.**



INTERNATIONAL AND CHINESE PARTICIPATION

With researchers of 67 nationalities and 17% of team members from outside the EU, we can see that the ERC is very open to international participation. It offers flexibility; a grantee originally based outside of Europe **can keep his or her affiliation with an institution outside of Europe** as long as he or she spends a significant time at their European host institution (defined as 50%). The researcher can hire team members from anywhere - team members are allowed to be based outside of Europe and have affiliation with non-European institutions. There is also a high level of portability allowed for in the ERC; grantees can move their projects freely within the European Research Area (although, as mentioned above, they usually do not) **For international researchers moving to Europe from a third country there are available additional start-up funding** (500 thousand for starting grant, 750 thousand for consolidator grant and 1 million € for advanced grant). Many European countries or institutions also try to attract ERC grantees by promising some top-up funds.

Researchers from outside of the European Research Area now make some 10% of starting and consolidating grantees and this number has been going up.

In the period of 2007-2013 (Framework Programme 7) there were **219 evaluated applicants from mainland China and 7 from Hong Kong**. In the year 2014, there were additional **117 evaluated applicants from mainland China and 2 from Hong Kong**. The ERC has therefore been becoming increasingly

Awarded ERC Grants to researchers from mainland China

Project main topic	HI country	ERC call	Domain	ERC grantees
Quantum information processing	DE	StG 2007	Phys&Eng	2
Tonal languages	NL	StG 2009	Soc&Hum	1
3D surface nano-patterning	DE	StG 2009	Phys&Eng	1
Molecular catalysts for energy and sustainability	CH	StG 2010	Phys&Eng	1
Control of multi-agent networks	NL	StG 2012	Phys&Eng	3
Bi-dimensional nano-materials for energy storage and conversion	DE	StG 2012	Phys&Eng	3
Electronic Voting	UK	CoG 2013	Soc&Hum	1
Systemic Risk	UK	CoG 2013	Soc&Hum	1
Nanoplasmonics	DE	StG 2014	Phys&Eng	1
Brain tumors	DE	CoG 2014	Life Sciences	2
Topological Light	UK	CoG 2014	Phys&Eng	2
Autophagy	DE	StG 2015	Life Sciences	3
Heterochromatin evolution and impact	AT	StG 2015	Life Sciences	3
RNA degradation	UK	CoG 2015	Life Sciences	2
Inorganic Oxygen Evolution Catalysts	CH	CoG 2015	Phys&Eng	2
Microbe-induced cancer	SE	CoG 2015	Life Sciences	2

Awarded ERC Grants to researchers from Hong Kong

Project main topic	HI country	ERC call	Domain	ERC grantees
Genetic Mapping	DE	StG 2014	Life Sciences	1
Ion-gated Interfaces	NL	CoG 2014	Phys&Eng	1
TOTAL				18

popular amongst Chinese applicants, especially the starting and consolidating grants. As of yet there have been **16 successful applicants from China and 2 from Hong Kong**, all either Starting- or Consolidating grantees. Project main topics can be seen in the above table (data as of 27 April 2016).

INTERNATIONAL RESEARCH VISITS TO ERC PROJECTS

In recent years there has been growing number of bilateral agreements (so-called “Implementing Arrangements” between the ERC and research organisations in non-European countries. Their purpose is to allow researchers from third countries to receive support from their research organisation to visit ERC teams. The foreign researchers are selected by the country’s research organization and the researchers themselves have to have the initiative in the “match making”. The ERC doesn’t intervene in selection. The costs of the visits are mostly covered by the foreign agency but the research costs are born by the ERC grantee. This collaboration is intended to enable Chinese researchers to undertake single and long-term (6-12 months) or multiple short-term research visits (e.g. for joint experiments) with the ERC-supported European teams. Research visits should begin at least 12 months prior to the termination date of their NSFC-funded projects. Multiple short-term visits should aggregate to 6 months minimum.

These kind of arrangement have been implemented in China since 2015 when the first call opened. In China, the partner is the National Science Foundation of China (NSFC). The researchers that want to participate need to be selected by the NSFC and be active NSFC grant holders.

The first arrangement was implemented with the NSF in the United States in 2012 and the NRF in Korea 2013 and both have been very successful. Since then there have been agreements signed with agencies in Japan, Argentina, China, South Africa, Mexico and in 2016 it’s likely there will be similar agreements signed also with respective agencies in Canada and Brazil.

The **ERC and the NSFC signed their agreement 29 June 2015**. Call for expression of interest to ERC Principal Investigators was launched on October 1 2015 and closed on October 31 2015. **413 ERC Principal Investigators (PIs) showed interest in receiving research visitors from China and 11 NSFC funded researchers from China responded to the 2015 call**. The first Chinese visits will take place this year. Prof Bourguignon declared his wish to develop the cooperation to a higher level.



DR MANUEL PÉREZ GARCÍA, ERC STARTING GRANTEE (ON THE LEFT) AND PROF JEAN-PIERRE BOURGUIGNON (ON THE RIGHT)

CONCLUSIONS

After introducing the many ways to contact the ERC through social media and other means there was a short testimonial (**Prof Manuel Garcia Perez**, Starting Grant Holder based in China and in Europe) and Q&A session where many senior Chinese scientists asked Prof Bourguignon about further details related to how to apply to an ERC grant from China and how Chinese applicants can maximize their probability to get funded.

As a whole, the event was a big success and attracted around 150 researchers and research related professional from all fields and all career levels, 140 of whom became new EURAXESS members.

Looking at the whole talk the main key points can be identified as follows:

- The European Research Council was founded in 2007 after the Lisbon Treaty. Before that there was no stipulation about basic research in European Union's treaties. It's the first research funding programme in the EU where the only condition is excellence. As such the research topics and the organisational structure are bottom-up.
- The funding has grown from 300 million € in 2007 to 1600 million € today. It's supposed to be up to 2200 million € in 2020. In total 10 billion € have been granted to ERC research projects
- About half of it goes to Physical sciences and Engineering, while the rest is split between Life Sciences and Social Sciences and Humanities. That makes the ERC the biggest Social Science and Humanities Funding Scheme in the world..
- There are 3 types of grants for researchers in different stages of their career; starting grants, consolidator grants and advanced grants.

- The grants give financial autonomy and creative freedom for 5 years as well as recognition and negotiation power for the researchers toward their hosting institution. ERC grants can serve as useful catalyst to get additional funding and top-up funding.
- Since the beginning 6000 PIs have been funded of 67 nationalities, 65% in early career (priority is given to younger researchers).
- 40 thousand researchers have worked as part of ERC teams. 30% are non-European. Around 1350 team members have come from China which makes it number 1 amongst non-European participants.
- 5 grantees have received Noble Prize after receiving ERC grant and 2 have gotten the Fields medal.
- 7% of publications resulting from ERC-funded research ends up amongst the world's top 1% most cited publications.
- Grantees outside of Europe can keep their affiliation with a non-European institution as long as they spend a significant amount at his European host institution (50%). For non-European researcher moving to Europe special start-up funds are available.
- 336 researchers from mainland China and 9 from Hong Kong have applied for an ERC grant, 16 mainlander Chinese and 2 from Hong Kong have been successful in getting a Starting/Consolidator grant.
- Since 2015 the ERC and NSFC have had an agreement that allows Chinese NSFC grant holders to get support to spend up to one year on ERC teams in Europe. The first call resulted in 413 ERC PIs that showed interest in receiving visits and 11 Chinese researchers interested in visiting. The first visits will take place this year.

To see the full slides Prof Bourguignon used go to here:

<http://ec.europa.eu/euraxess/data/linksImages/china/ERC.Presentation.UCAS.23.6.2016.pdf>